Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone, Sound Waves
PUBLISHED WEEKLY BY TELEPHONY PUBLISHING CORP.
608 S. Dearborn St., Chicago

H. D. FARGO, President and Treasurer
S. R. EDWARDS, Editor and Secretary

H. D. FARGO, Jr., Vice-President and Advertising Manager
D. C. SORENSEN, Western Advertising Manager

Entered as second-class matter September 4, 1908, at the postoffice at Chicago, Ill., under act of March 3, 1879.

Volume 90
Number 26

CHICAGO, SATURDAY, JUNE 26, 1926

Subscription — 10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

COURTEOUS EMPLOYES ESSENTIAL TO COMPANY SUCCESS

"We are never too old to learn, and one of the things I have just learned is that it is impossible to lay too much emphasis on the importance of service company employes being courteous and helpful," said a well-known telephone man in TELEPHONY's office the other day.

"In my opinion your journal can do no greater service to the telephone business than to urge increasing attention to this phase of operating work. It may seem an old story, but I just had its real value brought home to me in a forceful way that convinced me that nothing is more essential than for a company to train its workers to be always courteous, cheerful and helpful while on duty."

* * * *

The speaker was right. Courtesy as an aid to building the good will of a utility company is no new topic. Some might even consider it worn almost thread-bare, but, as this telephone man said, it is of constantly-increasing importance. The theory that service, not financial profit alone, should be the controlling motive in all business is steadily growing in favor, and courtesy to the public has come to be a principal factor in that program.

Of course, telephone companies and other service corporations were the first to recognize the necessity of cultivating public relations and to adopt a policy founded on courtesy and helpfulness. In fact, it was the example thus set by the service companies that undoubtedly led business concerns generally to see that the public good will is the only corner-stone on which can be built an enduring business success.

* * * *

"I had occasion to visit several telephone plants within the last month and my observations made me realize more than ever how vital it is for company employes to bear this idea in mind," said the TELEPHONY visitor. "In one town the local company had a well-equipped up-to-date exchange building. When I entered, my first impression was inclined to be favorable, but the person in charge was so indifferent—not to say grouchy—that I went away totally dissatisfied and nursing a grudge myself.

"There was no atmosphere of courtesy or friendliness there, and that lack made me forget whatever favorable ideas I was disposed to form about the company when I arrived.

The next company I called upon was of about the same size, and situated about the same, but the minute I stepped into the office I could feel the difference—and it was a pleasing difference. I was greeted with a smile and soon made to feel that every one there was really interested in making me welcome, and anxious to be of service.

It was a friendly place; the workers were cheerful and courteous and showed a desire to meet everybody half-way. I could actually feel a glow of good feeling, and I tell you I went away re-convinced that the biggest asset any service company can have is a staff of workers who have learned and who practice the lesson of courtesy and helpfulness."

* * * *

Nothing could be truer. Everybody prefers to deal where he gets courteous, friendly treatment—and the chances are the average man would rather spend his money at a place where smiles are visible than where Old Man Grouch controls, even though the latter has better goods and offers better bargains.

The habit of courtesy can be cultivated and developed just like bodily strength can be developed—by regular exercise.

Make your exchange office a courtesy gymnasium, and watch your business good will grow!

* * * *

And in connection with the same thought, it is estimated that the tolls on the word 'please' in telegrams sent in the United States amount to $10,000,000 a year. It is not often that the word is vitally necessary to the thought meant to be conveyed by the telegram, but it is usually necessary to express the feeling that lies behind the message. Therefore, practical business men who cut down on expense spend the extra money to add the courteous 'please' because they realize that it is important to gain good will even in that small way; in fact, just as important generally as to make the meaning of the telegram clear.

Telephone companies long ago inaugurated the practice of stressing courtesy in wire communication. The operator's "Number, please?" has come to be an institution, and it is uttered in the "voice with a smile." Probably there is no way to estimate how much labor and time would be saved by eliminating "please" from telephone messages, but undoubtedly they would be considerable. Of course, such economy in effort would be entirely wrong, for results show that it pays to be courteous, kind and friendly.

Telephone operators have done a great deal to spread the gospel of kindliness and set a good example of courtesy before the general public. It has had a good effect, but it must be admitted there are many telephone-users who still have the lesson of courtesy to learn.

* * * *

Reference was made in these columns some time ago to an investigation being made by the Federation of Women's Clubs to ascertain to what extent women living on farms use modern comforts and labor-saving devices such as the telephone, the automobile, washing machines, electric irons, vacuum sweepers and the like. The idea was to help the farmer's wife get her rights if the survey demonstrated that the farmer spent all the family money for machinery to lighten his own work and left none with which to buy household helps.

While the survey is not completed for all states, it has progressed far enough to develop the surprising fact that the farm women are but little interested in labor-saving devices. They do not crave machines to do the family washing and ironing, being apparently well satisfied with the old methods, but they do want a telephone, an automobile and to some extent the radio.

The Federation's inquiry shows that women on the farms are content to do their work as their mothers and grandmothers did, but that they need the telephone to bring their neighbors nearer, and prefer the family flivver for trips to town to riding behind the farm team—even even when they can get it. The radio furnishes desirable entertainment on occasions—but what lonesome farm-wife would not prefer a visit over the telephone, or a motor ride, to listening to a radio program while sitting around home?

One thing the Federation's survey has proved is that the telephone is the most indispensable combined comfort and necessity which the farm woman counts among her possessions. And they are many.

COMING CONVENTIONS.

Vermont, Burlington, Van Ness House, June 29 and 30.

Pennsylvania, Philadelphia, Bellevue-Stratford Hotel, August 30, 31 and September 1.

Indiana, Indianapolis, Claypool Hotel, September 21, 22 and 23.

United States Independent Telephone Association, Chicago, Hotel Sherman, October 12-15.

Observations on Office Management

Developing a Better Sense of Proportion in Field Traffic Men—Things That Must Be Right in an Exchange if Service Is to Be Rendered Economically—Article Awarded First Prize in Traffic Division, "Telephony's" Prize Contest

By B. C. Bellows,

General Supervisor of Toll Traffic, Illinois Bell Telephone Co.

An essential quality in any successful executive is a sense of proportion. In looking back over the 20 years that I have been working on telephone traffic problems, a considerable part of which has been spent in either actual field administration or work closely associated with it, it seems to me that this quality has not been sufficiently emphasized in telephone traffic office management.

I do not believe that there is a telephone traffic man who has any problem as to what to do with his spare time. His problem is how to make the most effective use of the hours per day available for carrying on his job.

I have seen efforts to assist field traffic men by listing the things which he should check up and be sure are going as he would have them. A complete list is astonishingly long; even the abbreviated lists which I have seen, are certainly long enough. Their weakness, I believe, has been that in them, proper effort has not been made to differentiate between the important and less important activities.

One does not have to consider this point of view long to realize that the duties of a traffic man cannot be divided into a list of important activities and one of relatively unimportant ones. The development of a traffic man must, however, emphasize the development of a sense of proportion which will lead him to correctly recognize which are the important activities and which the less important under any set of conditions which he may face.

A further study of the problem of office management seems to me to make possible the listing of a small number of things in an office which must be right if satisfactory service is to be rendered economically. I think there are eight things which can be listed in this class and which I believe are worth while listing, because too often the man in charge of traffic work assumes that these things are properly done when actually they are not. These eight are:

First: That as accurate an estimate as possible of the traffic to be handled during the coming two months, and the number of operating employes required to handle this traffic, be made and a schedule be prepared for the proper assignment of the people available. In some cases the preparation of this estimate falls entirely on the man in charge of the office. In other cases it is prepared for him by a force adjustment bureau.

The latter plan saves him a lot of time but should never lead him to shirk to the slightest extent his full personal responsibility for the estimate of traffic and people and correctness of the schedule.

Second: The schedule, which he believes to be the best, must be actually in effect. He cannot impress this too strongly on his chief operator, as we find only too often that such is not the case. An operator resigns and a new employe is taken on. The new employe probably cannot take the work of the employe who resigned, or of an operator who is ill and will be out for several weeks, and the chief operator forgets to make the necessary reassignment of other people so that, in the end, she has not the schedule in effect she is supposed to have.

Offices generally have relief operators available to meet conditions of this kind, but how frequently we find that the relief operator's hours are not changed so as to coincide exactly with the hours of the operator whose place she is taking.

These are just a couple of examples, but there seem to be hundreds of other things which result in an assignment of people different from the schedule which is supposed to be in effect.

Third: The program for employing and training new people, which is based on the estimate of traffic and people required, must be actually in effect. A circumstance which seems to happen only too frequently is that the plan calls for training three new employes beginning the first Monday in the month.

The chief operator, however, delays assembling applicants or notifying girls on the waiting list and, when Monday comes, the three new employes are not available for training. Sometimes one or two of them are, and they must be held and paid until the third member of the class can be secured. Sometimes the delay in starting the class results in their not being trained in time and, as a result, there is an overload in the office.

Fourth: The board load must be balanced; that is, the load must be distributed over the positions in use so as to give all operators their fair share of the total load. In some cases, lightly-loaded positions are intentionally set up, to which new employes may be assigned, but there must be frequent enough checks of the board load to be sure that there are no heavily-overloaded positions.

Fifth: Proper instruction of students. As far as I know there has never been a plan of training a new employe, by which she can become a thoroughly efficient operator in the three or four weeks usually available for preliminary training. The further development of that operator by the regular supervisory organization is however, more or less a hopeless task, if the preliminary training has not been fundamentally sound.

All traffic men, I think, will agree that it is essential to present to the student operator as little to learn as we can and at the same time enable her to handle the work at the position to which she is to be assigned.

Expressed in another way, I think that a good preliminary training course should constitute a thorough grounding in the fundamentals of handling frequently-occurring situations, and that the student's mind should not be distracted to attempt to cover the handling of relatively infrequent situations; also the preliminary training should have plenty of drills in the handling of equipment and an intensive development of overlapping operations and other things of this sort which have so much to do with the operator's ability to handle a reasonable load.

Sixth: There must be within the office a plan for developing every employe in it. This is intended to cover all except the student operators, for whom a special course of training has been prepared. The plan for developing the individual must be so worked out that the supervisory organization has a fair picture of the operators' work, and it must be so administered as to be looked upon by the operators as helpful.

Expressing the same thought in another way, we must avoid basing our opinion of the operator on an individual piece of exceptionally bad or exceptionally good operating, which is not characteristic of her regular work, and the manner of taking up the work with the operator must be such that it is helpful toward correction and not simply criticism. While I have mentioned the operator particularly in these examples, this same principle must apply in the development of supervisors by the chief operator or of the chief operator by the man in charge.

Seventh: The organization of the office must be such that the man in charge can be sure that the activities of the office correspond with his idea of them. Too frequently one can talk with a man in charge of an office and be told many things that he is doing in his operating room, only to find on actual inspection that these activities are not being carried on at all or are being carried on in a very different way than he thought they were.

Eighth: All reports made by the office must be prepared in accordance with the instructions and be accurate. I think we can assume that no company management is asking for unnecessary reports. They need the reports they receive for a proper picture of the service rendered and the efficiency of the office. They cannot obtain proper reports if those in the office who prepare them have not been properly trained for their preparation, and if those in charge of the office do not thoroughly appreciate the importance of the greatest possible accuracy.

Clerical work is usually considered a nuisance by operating-room people. In small offices, where there is not enough of this for a special clerical force, it must be done by various members of the operating force. Too frequently this results in people being assigned to the work who have had no training in the preparation of the report; people who have not sufficient natural talent for figures to accurately perform the arithmetic required; or people who, looking upon the work as a nuisance, are careless in doing it.

Now, of course, everyone realizes that these eight points are not the whole job by any manner of means; neither are they, by any means, the only essential activities. The provision of the necessary amount of equipment and the proper arrangement of equipment, maintenance of equipment, subscribers' lines and toll circuits are not included, and yet it is obvious that good service cannot be rendered if the operators are not provided with the proper tools. None of the activities which are classified generally under personnel work have been mentioned. Nothing has been said of proper ventilation, cleanliness of rest rooms, proper lighting, and so on through the list of things which cannot be overlooked, if a satisfactory all-around job is to be accomplished.

It is my thought that no successful

(*Please turn to page* 18.)

Mr. Bellows Has Been Engaged in Telephone Traffic Work for 20 Years and His Observations on Office Management Merit Careful Reading.

Management is a question that has been before the telephone industry for the past few years and its importance has frequently been stressed in "Telephony's" columns. In every branch of the industry are opportunities for development of management on the part of employes—even in the management of themselves in their work.

Traffic management, or rather management of the traffic office as distinguished from the business office, is something upon which not very much has been published, although it, naturally, has received a great deal of attention. The point of view on office management as presented by Mr. Bellows should interest not only traffic people but be very helpful to them in raising or improving their standards of service.

For 20 years Mr. Bellows has been engaged in traffic work, having started with the long lines department of the American Telephone & Telegraph Co. soon after his graduation from Cornell University in 1906. He was with the A. T. & T. Co. until 1912 when he entered the employ of the Western Union Telegraph Co., becoming its traffic engineer in 1914. Late in that year he returned to the A. T. & T. Co. as service engineer at New York and six years later was sent to Chicago as division superintendent for the A. T. & T. Co. In November, 1923, Mr. Bellows became the general supervisor of toll traffic for the Illinois Bell Telephone Co.

We all have to make decisions in work and Mr. Bellows' analysis provides considerable food for thought.

Power Cabling of Automatic Plant

Mathematical Investigation of Economy of Copper for Power Distribution of an A. T. M. (Strowger) Automatic Telephone Exchange — Method of Determining Mathematical Expression for Calculating Suitable Voltage Drops

By A. Prado,

Engineering Department, Automatic Telephone Mfg. Co., Ltd., Liverpool, England

The object of this article is to outline a method of determining mathematically an expression for the calculation of suitable voltage drops, and so enable the power cabling of an A. T. M. (Strowger) automatic telephone exchange to be effected with a high degree of economy.

The power cabling of an automatic exchange is shown diagramatically in Fig. 1, and consists of the cables between the main battery and the power board, between the power board and the distribution fuse board, and between the distribution fuse board and the automatic equipment.

The cross-sectional area of the cables from the battery to the apparatus is not only dependent upon the value of the current flowing in it and the length of the circuit, but also upon the permissible voltage drop.

In view of the fact that the permissible voltage drop between the battery and the apparatus is only one volt, the cross-sectional area of the cables carrying the current will, consequently, be large. It will be noticed in Fig. 1 that the cross-sectional area of the cables between *B* and *D.F.B.*, *D.F.B.* and *A* can be varied to any desired value, according to the magnitude of the voltage drop between these points.

For a given current and a given length of cable, the weight of copper is directly proportional to the area and, consequently, inversely proportional to the voltage drop.

Let us take I as being the busy-hour load current, and I_1, I_2, I_3 ..... I_n, the current consumption allowed for each individual piece of apparatus in the exchange, such as line-switch units, selector trunk boards, repeater boards, etc.

The busy-hour load current is such that, $I < I_1 + I_2 + I_3 + \ldots\ldots + I_n$.

Since sectional area of cable = constant × length of cable × current/voltage drop, and that for a given current and length of cable, weight of copper ∝ sectional area of cable, the total weight of copper between the battery and the apparatus can be increased or decreased, according to the value given to the voltage drop x, Fig. 1. It is, therefore, obvious that there must be a certain value for x at which the total weight of copper in circuit will be a minimum. The problem to be solved is to determine this value of x.

It has already been stated that the weight of copper varies inversely with the voltage drop, so that in order to find at what value of voltage drop x, there is a minimum weight of copper, a mathematical expression must be found connecting the total weight of copper in circuit and the voltage drop x.

Having found such a mathematical expression or function connecting these two quantities, a study of its rate of variation will lead to some solution.

By taking the voltage drop x, as the independent variable, and weight of copper W, as the dependent variable, we can by differentiating the function find what value of x will make the weight of copper a minimum. The solution, therefore, depends upon the fact that the function under consideration admits of continuous variation within a certain range of the independent variable; further, that at some point within that range the differential coefficient $\frac{dW}{dx}$ vanishes, and that as it passes through the value zero, it changes from negative to positive.

Having the busy-hour load current I, and cable-loop length l between the battery and the distribution fuse board, the current consumption I_1, I_2, I_3, ... I_n, allowed for each piece of apparatus, and the respective cable loop lengths l_1, l_2, l_3, ... l_n, between the latter and the distribution fuse board, we can show that the value of the voltage drop x, which corresponds with a minimum weight of copper, is given by

$$x = \frac{1}{1 + \sqrt{K}}$$

where

$$K = \frac{f_1 I_1 + f_2 I_2 + f_3 I_3 + \ldots\ldots + f_n I_n}{f\ I}$$

The value of K, therefore, depends upon the known value of the various currents and cable-loop lengths in feet.

We can now proceed to prove the foregoing formula.

The sectional area in square inches of the cables between *B* and *D.F.B.* is given by:

$$s = k\,l\,I/x \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where k is a constant depending upon the specific resistance of copper, and takes account of the conversion of feet into inches.

The sectional area in square inches of the cables between *D.F.B.* and *A* is given by:

$$s_1 = \frac{k\,l_1 I_1}{1-x};\quad s_2 = \frac{k\,l_2 I_2}{1-x};\quad s_3 = \frac{k\,l_3 I_3}{1-x} \ldots\ldots\ldots\ldots$$

$$\ldots\ldots s_n = \frac{k\,l_n I_n}{1-x} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Let Θ denote density of copper in lbs. per cubic inch; w denote weight of copper between *B* and *D.F.B.* in lbs.; $w_1 + w_2 + w_3 + \ldots\ldots + w_n$ denote weight of copper

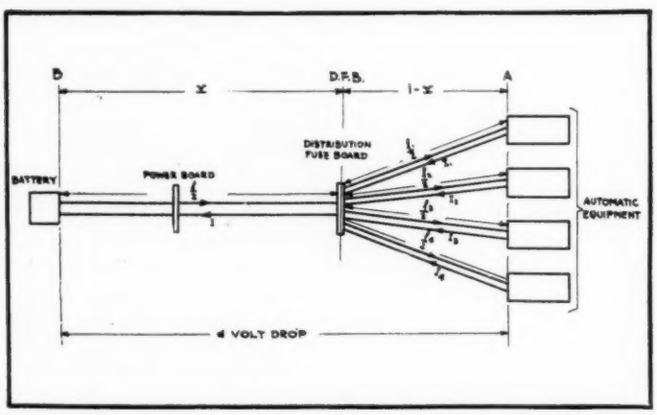


Fig. 1. Illustration of Variation of Cross-Sectional Area of Cables, According to Voltage Drop, with One Distribution Fuse Board.

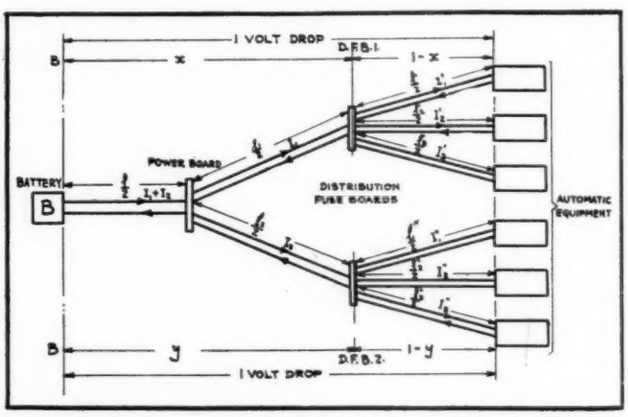


Fig. 3. Variation of Cross-Sectional Area of Cables, According to Voltage Drop, with Two Distribution Fuse Boards.

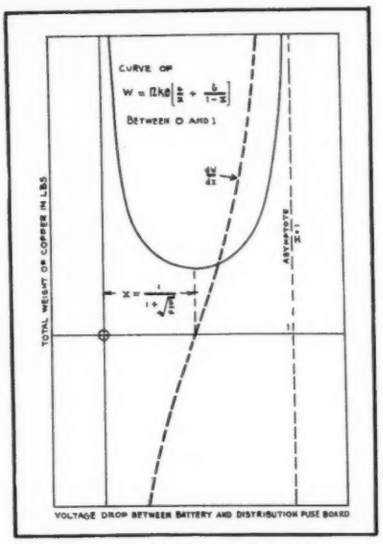

CURVE OF
BETWEEN 0 AND 1
ASYMPTOTE
TOTAL WEIGHT OF COPPER IN LBS
VOLTAGE DROP BETWEEN BATTERY AND DISTRIBUTION FUSE BOARD

Fig. 2. Graphical Interpretation of Voltage Drop and Weight of Copper.

between *D.F.B.* and *A* in lbs. Then since weight = volume × density, we have

$w = 12\ ls\theta,\ w_1 = 12\ l_1 s_1 \theta,\ w_2 = 12\ l_2 s_2 \theta,$

$w_3 = 12\ l_3 s_3 \theta,\ \ldots\ldots\ w_n = 12\ l_n s_n \theta \ldots\ldots (3)$

Substituting (1) and (2) in (3), this can be written:

$$w = 12\,k\,\theta\,\frac{FI}{x},\quad w_1 = 12\,k\,\theta\,\frac{F_1 I_1}{1-x},$$

$$w_2 = 12k\,\theta\,\frac{F_2 I_2}{1-x},\quad w_3 = 12\,k\,\theta\,\frac{F_3 I_3}{1-x}\ \ldots\ldots$$

$$\ldots\ldots w_n = 12\,k\,\theta\,\frac{F_n I_n}{1-x}\ \ldots\ldots\ldots\ldots (4)$$

The total weight of copper between *B* and *A* is:

$$W = w + w_1 + w_2 + w_3 + \ldots\ldots + w_n \quad \ldots (5)$$

Substituting (4) in (5),

$$W = 12\,k\,\theta\,\frac{FI}{x} + 12\,k\,\theta\,\frac{F_1 I_1}{1-x} +$$

$$12\,k\,\theta\,\frac{F_2 I_2}{1-x} + 12\,k\,\theta\,\frac{F_3 I_3}{1-x} + \ldots\ldots$$

$$+ 12\,k\,\theta\,\frac{F_n I_n}{1-x} \text{ or } W = 12\,k\,\theta\left[\frac{FI}{x} + \frac{F_1 I_1 + F_2 I_2 + F_3 I_3 + \ldots\ldots + F_n I_n}{1-x}\right] \ldots (6)$$

If we put $a = FI$ and $b = F_1 I_1 + F_2 I_2 + F_3 I_3 + \ldots\ldots + F_n I_n$ (6) can be written in the form:

$$W = 12\,k\,\theta\left[\frac{a}{x} + \frac{b}{1-x}\right] \ldots\ldots\ldots\ldots (7)$$

Differentiating this for a minimum, we have:

$$\frac{dW}{dx} = 12\,k\,\theta\left[-\frac{a}{x^2} + \frac{b}{(1-x)^2}\right]$$

$$= 12\,k\,\theta\left[\frac{b}{(1-x)^2} - \frac{a}{x^2}\right] \ldots\ldots (8)$$

The condition for a minimum or a maximum occurs when:

$$\frac{dW}{dx} = 0$$

that is

$$12\,k\,\theta\left[\frac{b}{(1-x)^2} - \frac{a}{x^2}\right] = 0 \ \ldots\ldots (9)$$

which can be reduced to the simple quadratic equation:

$$(b-a)\,x^2 + 2\,ax - a = 0 \ \ldots\ldots\ldots\ldots (10)$$

Solving this for x, we have for the roots:

$$x = -\frac{a}{b-a} \pm \frac{\sqrt{ab}}{b-a} \ \ldots\ldots\ldots\ldots (11)$$

that is, $x = -\dfrac{a}{b-a} + \dfrac{\sqrt{ab}}{b-a} = \propto \ldots (12)$

$$x = -\frac{a}{b-a} - \frac{\sqrt{ab}}{b-a} = \beta \ \ldots\ldots\ldots\ldots (13)$$

at which values, $\dfrac{dW}{dx}$ vanishes, and therefore will change sign as x increases through the values $\propto$ and β, the required condition being that $\dfrac{dW}{dx}$ should change from negative to positive.

If we consider (12) this can be written in the form

$$x = \frac{\sqrt{ab} - a}{b-a}$$

which can further be simplified to

$$x = \frac{1}{1 + \sqrt{b/a}} \ \ldots\ldots\ldots\ldots (14)$$

It will be seen by inspection that as x increases through the value $\dfrac{1}{1+\sqrt{b/a}}$ (8) changes from negative to positive. Since the voltage drop between *B* and *D.F.B.* cannot be zero or unity, the expression $\dfrac{1}{1+\sqrt{b/a}}$ is always > 0 and < 1. Hence for $x = 0$, that is $x < \dfrac{1}{1+\sqrt{b/a}}$, $\dfrac{dW}{dx} = -\infty$

for $x = \dfrac{1}{1+\sqrt{b/a}}$, $\dfrac{dW}{dx}$ vanishes and for

$x = 1$, that is $x > \dfrac{1}{1+\sqrt{b/a}}$, $\dfrac{dw}{dx} = +\infty$.

The expression $W = 12\,k\,\theta\left[\dfrac{a}{x} + \dfrac{b}{1-x}\right]$ must, therefore, be a minimum when $x = \dfrac{1}{1+\sqrt{b/a}}$. If we write $\dfrac{b}{a} = K$ in (14) we have:

$$x = \frac{1}{1+\sqrt{K}} \ \ldots\ldots\ldots\ldots (15)$$

The voltage drop between the battery and distribution fuse board is thus given by (15) and this corresponds to a minimum weight of copper.

The voltage drop x, will be greater, equal to or less than ½ according to the value of K.

When $b > a$, $K > 1$, the voltage drop x, being less than ½.

When $b = a$, $K = 1$, the voltage drop x, being equal to ½.

When $b < a$, $K < 1$, the voltage drop x, being greater than ½.

Hence, in order to save copper, the voltage drop between *D.F.B.* and *A* should be $> ½$ when $b > a$, equal to ½ when $b = a$, and $< ½$ when $b < a$. This, however, cannot always be realized in practice, as it would imply tables with an infinite number of cable cross-sections, which do not exist commercially.

The ratio of the weight of copper between *D.F.B.* and *A* to the weight of copper between *B* and *D.F.B.* is:

$$R = \frac{\dfrac{b}{1-x}}{\dfrac{a}{x}} = \frac{bx}{a(1-x)} \ \ldots\ldots\ldots\ldots (16)$$

and since $b = Ka$ and $x = \dfrac{1}{1+\sqrt{K}}$ we have:

$$R = \sqrt{K} \ \ldots\ldots\ldots\ldots (17)$$

Hence, when $b > a$, $R > 1$, the weight of copper between *D.F.B.* and *A* is greater than between *B* and *D.F.B.*

When $b = a$, $R = 1$, we have equal weights of copper.

When $b < a$, $R < 1$, the weight of copper between *D.F.B.* and *A* is less than between *B* and *D.F.B.*

The general shape of the curve,

$$W = 12\,k\,\theta\left[\frac{a}{x} + \frac{b}{1-x}\right] \ldots\ldots\ldots (18)$$

between the value 0 and 1, is shown in full, while the dotted curve represents its differential coefficient, Fig. 2. This graphical interpretation shows that as the voltage drop x, increases from 0 to 1, the weight of copper, W, decreases from infinity, passes through a minimum stationary value, at which the differential coefficient vanishes, and then increases to infinity.

The dotted curve shows that as (18) passes through the minimum stationary value, $\dfrac{dW}{dx}$ changes from negative to positive. The range of the independent variable in which the function admits continuous variation is 0 and 1, and at which value it becomes infinite.

The value of the constants, a and b, which determine K, will fix the position of the curve.

It should be noted that the voltage drop,

which is taken as abscissa in Fig. 2, is the drop between B and $D.F.B.$; the mathematical interpretation of the curve being that since the sum of the drops across the entire circuit is unity, then as the drop across B and $D.F.B.$ tends towards zero, the total weight of copper becomes infinite.

Similarly, as the voltage drop across B and $D.F.B.$ approaches unity, the drop across $D.F.B.$ and A tends towards zero, with the result that the total weight of copper again increases indefinitely.

When the given permissible voltage drop is less than unity, as would be the case when working out the voltage drop for a portion of the circuit, (7) can be written:

$$W = 12\,k\,\Theta\left[\frac{a}{x} + \frac{b}{v-x}\right] \quad \ldots\ldots\ldots (19)$$

where $v < 1$, differentiating,

$$\frac{dW}{dx} = 12\,k\,\Theta\left[\frac{b}{(v-x)^2} - \frac{a}{x^2}\right]$$

we have as before $\frac{dW}{dx} = 0$ for a minimum or a maximum, that is

$$12\,k\,\Theta\left[\frac{b}{(v-x)^2} - \frac{a}{x^2}\right] = 0$$

or $(b-a)\,x^2 + 2\,avx - av^2 = 0 \ldots\ldots (20)$

Solving this, we have for the roots

$$x = \frac{-av + v\sqrt{ab}}{b-a} \quad \ldots\ldots\ldots\ldots (21)$$

and $x = \frac{-av - v\sqrt{ab}}{b-a} \quad \ldots\ldots\ldots\ldots (22)$

we can write (21) in the form:

$$x = \frac{v}{1 + \sqrt{b/a}} \quad \ldots\ldots\ldots\ldots (23)$$

or $x = \frac{v}{1 + \sqrt{K}} \quad \ldots\ldots\ldots\ldots (24)$

and this obviously makes (19) a minimum.

The remainder of the proof is identical, with the exception that v voltage drop should be substituted for unity voltage drop. The formula $x = \frac{v}{1 + \sqrt{K}}$ can also be applied for any voltage drop greater than unity.

The general shape of the curve,

$$W = 12\,k\,\Theta\left[\frac{a}{x} + \frac{b}{v-x}\right]$$

will be unaltered, the only difference being that, in this case, the asymptote to the curve is moved bodily to the right or left of the position shown in Fig. 2, according to whether the voltage drop is greater or less than unity.

Up to this point we have considered the case of an exchange having one distributing fuse board only. The investigation can, however, be further extended to the case of an exchange having more than one distribution fuse board. The total weight of copper in such a case would be a function of more than one voltage drop.

Let us consider an exchange having two distribution fuse boards. The scheme is shown in Fig. 3, where the voltage drop between B and $D.F.B.$ 1 is different to that between B and $D.F.B.$ 2.

The problem can be greatly simplified by assuming two independent circuits from the battery and treating each circuit as a single one. The actual cross-section of the cables between B and $P.B.$ would of course be equal to the sum of the cross-sections of the cables between the same points of each circuit considered independently.

The voltage drop corresponding to a minimum weight of copper can be determined for each circuit by formula (15). The total minimum weight of copper for the entire circuit will then be the sum of the minimum weights of copper in each circuit.

We can write for the voltage drop between B and $D.F.B.$ 1,

$$x = \frac{1}{1 + \sqrt{K_1}}$$

where $K_1 = \frac{b}{a}$

$$= \frac{l'^2_1 I'_1 + l'^2_2 I'_2 + l'^2_3 I'_3 + \ldots\ldots + l'^2_n I'_n}{(l + l_1)^2 I_1}$$

and for the voltage drop between B and $D.F.B.$ 2.

$$Y = \frac{1}{1 + \sqrt{K_2}}$$

where

$$K_2 = \frac{d}{c}$$

$$= \frac{l''^2_1 I''_1 + l''^2_2 I''_2 + l''^2_3 I''_3 + \ldots\ldots + l''^2_n I''_n}{(l + l_2)^2 I_2}$$

If more than two distribution fuse boards are needed, the calculation can easily be extended to cover such a case.

The following example will serve as an illustration of the application of the formula.

To find what voltage drop between B and $D.F.B.$ in Fig. 1 will correspond to a total minimum weight of copper having the following figures:

Apparatus.	Current in amps.	Loop length of cable from D.F.B. to A.
Line-switch units L1-10...	50	90′-0″
Line-switch units L11-20...	50	60′-0″
Composite rack.....	30	80′-0″
Manual fuse board.....	15	123′-0″
First selector	10	112′-0″
Second selector	10	92′-0″
Meter rack	5	103′-0″
Battery 106		103′-0″ from B to D.F.B.

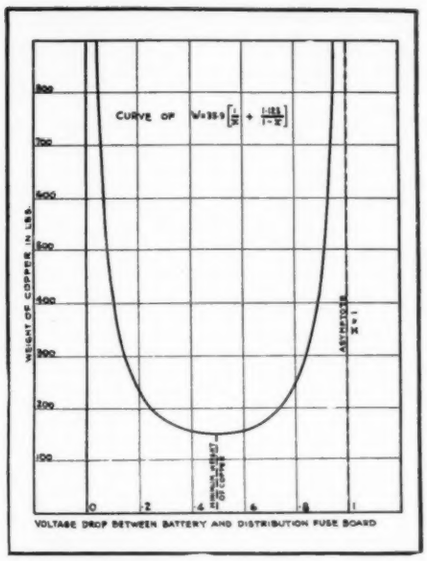


Fig. 4. Relationship Between Voltage Drop and Weight of Copper.

We have $x = \frac{1}{1 + \sqrt{K}}$

Where $K = \frac{b}{a}$

$$= \frac{I^2_1 I_1 + I^2_2 I_2 + I^2_3 I_3 + \ldots\ldots + I^2_n I_n}{I^2 I}$$

From the figures given in the foregoing table, we have:

$90^2 \times 50 =$	405,000
$60^2 \times 50 =$	180,000
$80^2 \times 30 =$	192,000
$123^2 \times 15 =$	226,500
$112^2 \times 10 =$	125,500
$92^2 \times 10 =$	84,500
$103^2 \times 5 =$	53,000
Total	= 1,266,500

This total gives us the value of b. Now the value of $a = 103^2 \times 106 = 1{,}125{,}000$. Hence $K = \frac{b}{a} = \frac{1{,}266{,}500}{1{,}125{,}000} = 1{,}125$. Therefore the voltage drop $x = \frac{1}{1 + \sqrt{1{,}125}} = \frac{1}{2.06} =$ 0.485. So that the voltage drop between B and $D.F.B.$ is 0.485 and the voltage drop between $D.F.B.$ and A is $1 - 0.485 = 0.515$.

A curve showing the relationship between the voltage drop x, and the total weight of copper, W, has been plotted for this example. This is shown in Fig. 4.

By plotting the curve $x = \frac{1}{1 + \sqrt{K}}$, the value of the voltage drop, x, can be obtained directly from this curve for different values of K with a sufficient degree of accuracy, Fig. 5.

Formula (24) is not only applicable to the power cabling of an A. T. M. (Strowger) automatic telephone exchange but may also be applied to direct current power systems, which involves distribution of electrical energy on a larger scale

Nebraska Association Plans Drive for Small Companies.

An intensive cultivation of the field during the remainder of the year was decided upon by the directors of the Nebraska Telephone Association at the meeting recently held in Lincoln. Last year the association secured some good results from the holding of a series of district meetings at a number of points in the state. The programs were furnished by experts from the larger companies and from the state railway commission, who discussed all problems from the technical to the practical.

It was found, however, that most of those who came to the district meetings were also fairly regular attendants at the state conventions, and many of them were not in any particular need of the information presented other than that it was given them from a different and newer angle.

Secretary George W. Kloidy recommended that, before the district meeting plan be again put into effect, the association, through its representatives, get in closer touch with the individuals owning and managing and operating the smaller exchanges, the ones for whom the association holds the most and best promise of good. It was decided that Mr. Kloidy should be put actively in the field, and do the necessary cultivating.

In order that this work may be properly financed an increase in the dues will be made so that it can be carried through to the end of the program. Mr. Kloidy will make the personal acquaintance of every active telephone man in the field, invite him to tell him his troubles, and aid him wherever this is possible.

The trouble with the small companies in Nebraska, as in other states, is very largely one of insufficient income. The state railway commission has held itself ready at all times to give proper rates when a proper showing was made. Most of the small companies' managers have too much to do to familiarize themselves with what is necessary in preparing that showing. Some of them are too busy even to attend properly to their accounting so that they know exactly what they are doing.

Mr. Kloidy will undertake to prepare any rate cases for trial. He has done this for a number of companies so far, and some of these will be filed within the next few weeks. He also added 25 companies to the membership of the association, and in other ways has carried the idea of service to the companies. His idea is that the association's growth is dependent more upon actually assisting non-member companies and teaching them in a practical way the advantages of joining with it rather than in telling them that if they join they will be able to take advantage of these benefits.

The association had invitations from the chambers of commerce in Omaha, Lincoln and Hastings as cities in which to hold the 1927 convention. That of Lincoln was accepted, as when the convention meets next February the legislature will be in session and it will be possible for telephone men to get in personal touch with their representatives.

The directors agreed to cooperate with the committee of the Sesqui-centennial at Philadelphia that has in charge the celebration in August of the progress of telephony. The next meeting will be in October. The directors accepted the invitation of President Warren Pratt to hold that meeting in his home town of Kearney.

Those in attendance at the meeting were Warren Pratt, president, Kearney; E. B. Wait, vice-president, Comstock; George W. Kloidy, secretary, Lincoln; W. E. Bell, treasurer, Lincoln; J. T. Shipley, Imperial; W. R. Johnson, Omaha; F. F. Roderick, Blue Springs and J. M. Christensen, Blair.

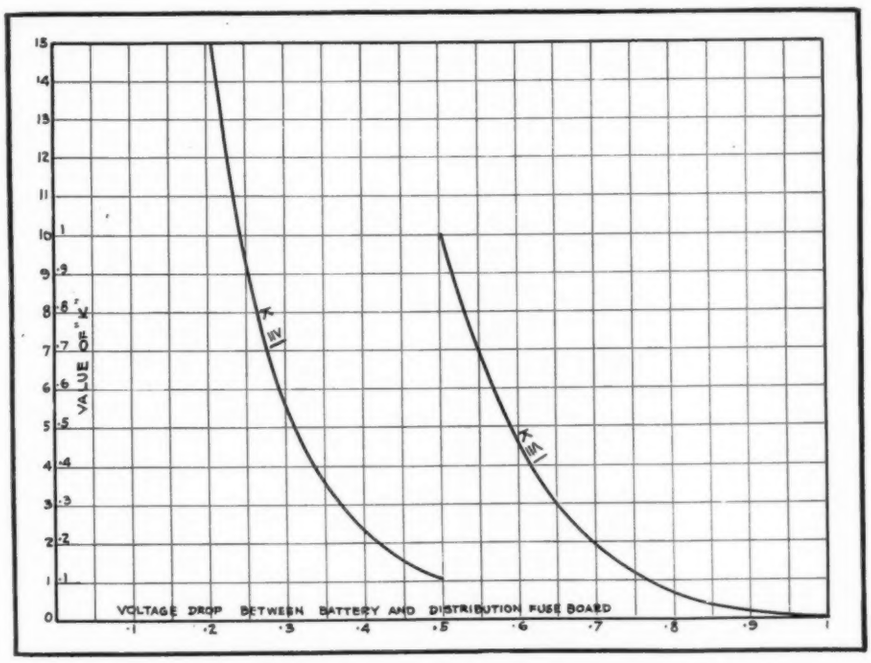


Fig. 5. Curve Giving Value of Voltage Drop for Different Values of "K."

Great Britain's Telephone Milestones; 1½ Million Mark Near.

Official figures just issued show that the total number of telephones in Great Britain and Northern Ireland should reach the 1½-million mark by the end of October. The figures show that during March last, just 50 years after the invention of the telephone, the total number of telephones in Great Britain and Northern Ireland was 1,421,150, of which 1,390,153 belonged to the Post Office system, 11,000 to railway and other private installations connecting with the national system, and about 20,000 to the systems maintained by Hull and the Channel Islands. The number of telephones in Great Britain has been doubled since 1913.

The first telephone exchanges in Great Britain were opened towards the end of 1879. There were probably not 10,000 lines working at the end of 1883; and the 30,000 mark was not reached until the close of 1888. This figure was doubled early in 1893, and quadrupled by the end of 1898.

In 1899 development began to be reckoned not by lines but by stations. The figure of 170,000 stations was more than doubled in the five years to 1904, when the total reached 367,000. This again was doubled early in 1913, and will be doubled again, in all probability, by the end of this summer.

The first 100,000 was reached in 1896; the 200,000 in 1900, and the 300,000 in 1903. Thenceforward, increases of 40,000 to 50,000 a year, followed, until the outbreak of the World War. After a period of stagnation, development reached 100,000 a year in 1923, and at present reaches that figure in ten months.

In the early days, the London system did not form such a large proportion of the whole as it does now. Up to 1890, the proportion was about a quarter; in 1893 it was one-sixth; in 1899 one-fifth; and in 1904 a quarter. Since 1912, however, London has contained a good third of the telephones in the United Kingdom, and in some years considerably more.

Rebuilding of Baroga County System of Michigan Is Completed.

The Baroga County Telephone Co., of Baroga, Mich., has completed the rehabilitation of its entire system. Wires and poles have been removed from the main streets and placed in the alleys and a new magneto switchboard has been installed.

Observations on Office Management

traffic man can fail to appreciate the importance of the eight things I have listed. I do believe, however, that many have spent, and do today spend, time on other things of less importance before those eight things have been thoroughly accomplished. For instance, in checking back over my own experience, I find that I cannot remember a single case in which the service in an office was poor, where one or more of those eight things was not badly out of line; and in questioning a number of traffic men I find that their experience check with mine.

Yet in many cases that I have known of, the activities of the man in charge of the office at which service is poor, have been devoted to many other things, and he has overlooked the correction of one or more of the fundamentals. For example, one case in which toll service was considerably below desirable standards, it was the opinion of the man in charge that the cause of the difficulty was extreme shortage in the supervisory force due to illness, shortage of toll circuits on one or two groups handling a very high proportion of the total toll calls of the office, poor operating at another office through which the office concerned switched considerable traffic, and several other things of this type.

Further investigation of the condition developed that the board was badly out of balance, resulting in congestion at some positions and tying the supervisors up with an excessive amount of redistribution of toll tickets. The schedule was not completely in effect, and the program for the development of the individual operator was not really developing. It was these conditions which were primarily responsible for the slow service rather than those to which the man in charge was directing his attention.

In another case in which local service was unsatisfactory, the reason assigned was the high proportion of inexperienced operators in the force. Again a check developed that the plan for developing the individual operator was not effective. Actual position counts showed that the older operators were in many cases carrying a lighter load than some of the inexperienced operators whom the man in charge thought were his real handicap.

I would like to repeat that what I am suggesting is: More emphasis on the items I have listed and less tendency to assume that those items are all right. As an example along this line, I recently asked a man in charge of a toll office what he would do if his report showed him that his speed of service had fallen off considerably below the desired objective.

His reply was that he would analyze the situation and find out whether the speed

(Concluded from page 13.)

was generally slow to all points or that only a few points were responsible for the poor showing. He would find out whether the delay was in getting the toll tickets to the proper position, and he mentioned several other detail toll operating practice features which might affect speed of service.

All of the things he mentioned were certainly points which might affect the speed of service. However, I suggest that they are all of relatively small importance until the man is sure that the schedule is in effect, that his board is balanced, and that his methods of training new people and developing the other people, are effective.

I have mentioned the need, as I see it, for the development of a better sense of proportion in field traffic men. This is required regardless of the condition of the office or the particular activities of the man in charge. Giving him a small list of essentials does not, of course, accomplish this, but I believe that it is a start in the right direction and that, as he realizes the importance of taking care of these before he gives his time to other matters, he will be led, if he has them all in good shape, to consider the next important thing to do, rather than to spend his time on the first thing that happens to come into his mind.

It is also my firm belief that any traffic man can reasonably be expected to keep all of the eight things I have mentioned in good shape in the offices under his charge when he properly understands their importance; and that, when he has all of those things going well, a great many other things which he might have spent his time on will be found to have disappeared. I do not believe that this will give him occasion to have to search very hard for valuable work to do, but I believe it will relieve the pressure from him to such an extent that all of his work will be more effective. If this is true, he will unquestionably worry less and get more fun out of the job, which, in turn, means a better job done.

Price for Telephone Installation Contracts in Japan, Declines.

In Japan, the price paid for installation contracts of telephones at the end of April was: Greater Osaka, 1,570 yen on an average; in Kyoto, 1,350 yen, and in Kobe 1,210 yen. As the price indicated but a small margin of only between 100 yen and 250 yen over installation expenses, the demand for telephones on urgent requests declined. In view of this, the Osaka Bureau of Communications, which has 14,700 telephones shortly to be put in its jurisdiction of eight prefectures, petitioned the Department of Communications to reduce the number by 400.

The Japanese authorities gave permission to the bureau, the allotment being as follows: Osaka, 4,500; Kyoto, 2,500; Kobe, 1,250, and others 6,050. Total, 14,300.

The charge by the bureau for the installation of a telephone is the same as last year; 1,300 yen in Osaka and 1,100 yen in Kyoto and Kobe.

Telephone Traces the Progress of Oklahoma Tornado.

An interesting article relative to the important part played by the telephone in tracing the course of a destructive tornado that visited eastern Oklahoma and in directing relief work was contributed to a recent issue of the Okmulgee Times by a writer signing himself as J. R. The article says in part:

"Science never may perfect a 'tornado cure,' but the telephone has made it possible to trace the progress of tornadoes and to time their progress so perfectly that the next step will be to perfect storm schedules so it will be possible to time their arrival. Yesterday's storm was traced by telephone practically from its point of origin in Okfuskee county until it had spent itself in Muskogee.

Within 15 minutes after the twister had visited the town of Morse, telephone operators said it was headed north by east. It was possible to tell, by the way wires went out, just what course the storm had taken. In another five minutes the telephone company reported that the storm was sweeping a path through the country four miles north of Okmulgee.

Even before the cloud had passed from sight, operators had learned that several houses had been blown away. Reporters for daily newspapers were on their way to the scene within 15 minutes after the storm struck. When they arrived at the devastated area, they found telephone company linemen already at work. There was hardly a telephone, telegraph or electric light pole left intact."

Buys New Jersey Tract for Experimental Radio Station.

The Bell Telephone Laboratories have authorized the purchase of a tract of 45 acres at Whippany, N. J., according to an announcement made by Edward B. Craft, executive vice-president.

The tract, which is close to the Whippany River, will be developed as an experimental station for the study of high-power radio transmission as an aid in the commercial development of broadcasting equipment. This development will be the fourth radio experiment station operated by the Bell Telephone Laboratories in New Jersey.

Sundry Snapshots Along the Trail

Observations and Comments, Pertinent and Otherwise On the Sunshine and Shadows of Telephone Work

By Well Clay

When doubts and fears assail you
And dark depressions trail you,
Tears will not avail you;
Pitch in and go to work.

When life seems bare of thrills,
And your body full of ills,
Don't resort to draughts and pills;
Pitch in and go to work.

If you mourn for times long fled
And life looks dark ahead,
Maybe wish that your were dead;
Pitch in and go to work.

It matters not just what you do
So that it engrosses you,
It will surely pull you through;
Pitch in and go to work.

There come times in the lives of all normal persons, probably, when introspection throws some very drab pictures on the screen of life and influences one to wonder if, after all, the game is worth the effort. This usually is the result of depleted nerve or health resources, or losses of other kinds, but happily the mood soon wears off; and good lively work of the kind that is interesting to the particular person affected, soon chases away the gloom, and the sun shines once more.

This mood is often induced by one being too long tied down to daily tasks of a monotonous nature which can be done without conscious thinking—automatically. In cases of this kind the unfortunate victim, not having to think about his work, gets to thinking too much about himself with disastrous results.

I am reminded of this line of truth by a recent article in TELEPHONY by Miss Anne Barnes, who advocates shutting the doors

"When Life Seems Bare of Thrills, and Your Body Full of Ills, Don't Resort to Draughts and Pills; Pitch in and Go to Work."

to all avenues which are open to letting into the mind dangerous and damaging thoughts and ideas. It frequently happens that we open the doors of our minds to look out on vistas which the mind should never contemplate. Some of these are very seductive to dwell on, but are death to energy, ambition and progress, if we allow our mental imaginings to lead us out along the dangerous pathways which all have a downward trend.

How nice sometimes to just say to ourselves, "What's the use of being in such a hurry about keeping the lines in repair; we will get along just as well if we take things a mite easy, and the patrons will be just as well off. Probably no one will need to call a doctor today, and fires don't happen very often."

A little giving in here, and a little letting up there is not noticed for a while but the final results are very satisfactory. By getting our minds used to being satisfied with something not the very best of which we are capable, we soon slack up a little more; and progress downward is a little faster than progress upward.

By killing any part of ourselves from non-use for the betterment of ourselves or mankind, just in that degree are we committing suicide. The muscles, which we allow to atrophy from laziness or lack of use voluntarily from other causes, we kill just as surely by preventing their being useful as though we did it deliberately with destructive intent.

If we do not live up to the duties rightfully imposed on us as workmen in the public utility service, we take away the sum of our possible accomplishments from the aggregate of the world's convenience and advancement by just so much; and it is volume which counts, whether it is water to float ships, power to light cities, to run labor-saving machinery, sales of merchandise, wealth, oil production, or public service.

We are likened to train dispatchers in our business; put in our places to keep the way clear that traffic may not be impeded by obstructions which it is in our power to eliminate. When we let things "go hang" for any reason, we are like the helmsman deserting the wheel and letting the ship whither it will.

It only is necessary at most times when we get a fit of negative feelings, to realize our condition and shut the doors to the source of the causes of our mental indisposition and physical delinquencies and open the doors on the sunny side. Work will then help us to forget the things which caused us to doubt, and soon the poison will be eliminated from our systems. It may be hard to break away at

"The Easiest Way Out Is to Shut the Doors Against the Deadly Draughts of Inaction and Lack of Interest and Let the Light In on the Sunny Side While You Take a Squint at Your Job from a New Angle."

first but the system will be successful in the end.

The rest cure is not good for a malady which requires exercises to throw it off; if a change of work is not possible, we can always help matters by having a change of attitude about the work we are doing. If we can visualize the nobility of our duties, instead of dwelling on their seeming sordidness and inconsequential value to the world, we can be of better cheer and more value to the world.

For the want of a splice, the circuit was lost; for the want of the circuit, the message was lost; for the want of the message, the doctor was lost; for the want of the doctor the life was lost—and all for the want of energy, or sense of responsibility, in some one whose business it was to keep the service fit; like the old story of the lack of the horseshoe nail we used to read about in our old school readers.

We all have pessimistic days when we feel like mourning and doubting, rather than honestly applying ourselves to our job; and the easiest way out is to shut the doors against the deadly draughts of inaction and lack of interest and let the light in on the sunny side while you take a squint at your job from a new angle. Try filling the mind with pleasant, constructive thoughts just before dropping off to sleep each night; and again upon awakening in the morning. It will work wonders and you will be at your best.

APHORISM: There is no halfway house of rest in the scheme of human progress.

THE POSTMAN'S BAG

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

As I came downtown behind a postman this morning, I could not help but think of the contents of his brown leather bag. I know, as well as you do, that there were missives pertaining to every sort of human desire and activity lying there, side by side. Daintily-tinted love letters, business letters, quarrel letters, letters of deception, and letters from lonely little mothers—letters, letters, letters—jostled together in the postman's pack, their secrets sealed tightly, one from another. In an hour two the postman's pack would be empty; bits of sadness and gladness would be dispensed hither and thither by the postman.

How like the letters in the postman's pack we mortals are. Unknowingly we touch elbows with the sad and the glad-hearted, the sick and the well, the wicked and the good, the discouraged and the optimistic. Daily every one of us, as we thread our separate ways through the crowd, are living, gripping bits of great human-interest stories. What readable books might be made of the record of any life that we brush by.

Surely, the rusty-looking little old lady, picking her way carefully across the busy street, has just as vivid a life's story as that of the beautifully-garbed woman in her car waiting for the little old lady to get out of her way.

And thus we brush by one another, day in day out, with our lives carefully concealed from the passing throng; like letters in the postman's pack, we jostle together.

I wonder if we might brighten up a corner for some one else occasionally if we were not always in such a hurry for ourselves. For instance, how hard we make it for everyone on a busy downtown street crossing when we disregard the traffic cop's signal and take a chance to cross over. Those who have received the order to move must think of two things: The traffic cop's orders and the safe passage of the lawbreaker.

The other evening I saw an old lady try again and again to go when the traffic cop gave the order to go. But she did not dare go because of the chances she would have to take with the lawbreakers. I saw she was lame. Finally she saw me standing there and she asked, in a sort of a quavery voice, "Are you waiting to cross over?" I told her that I was. "May I hold on to your arm when you cross over? I am afraid I cannot make it in time."

I wonder how many times in my hurry I fail to be more human than a sealed letter as I cut in on my neighbor's right-of-way time.

Van Buren County Company Buys Dowagiac Telephone Co.

The Van Buren County Telephone Co. has purchased a controlling interest in the Dowagiac Telephone Co. of Dowagiac, Mich., which operates 1,800 telephones in Cass county. Dr. O. M. Vaughn, Jr., of Covert, president of the Van Buren company, has been elected head of the Dowagiac company to succeed Charles Heddon of Dowagiac. The companies will not be merged, it is stated.

Vail National Awards for Noteworthy Service in 1925.

Five Bell employes in different parts of the country were recently awarded Theodore N. Vail silver medals for conspicuous service during 1925 by the National Committee of Awards. The medals, accompanied by cash awards of $250 each were presented to the following:

Mrs. Josephine L. August, night operator of the Dowagiac Telephone Co., Cassopolis, Mich.; Mrs. Mary Regina Smith, operator of the Fabens Telephone Co., Fabens, Texas; Everett C. Nelson, installer repairman, New York Telephone Co., Niagara Falls, N. Y.; Emory Daniel Stine, lineman, Bell Telephone Co. of Pennsylvania, York, Pa.; and Miss Ruby La Verne Wilson, operator for the Southwestern Bell Telephone Co. at Washington, Ark.

Mrs. August frustrated one of the most spectacular attempts at bank burglary in the history of Michigan by her resourcefulness and courage.

Remaining steadfastly at her post on the morning of August 9, 1925, until flood waters crushed in the adobe walls of the central office, Mrs. Smith saved thousands of dollars' worth of property from destruction and gave warnings of impending danger which, in all probability, were the means of saving the lives of several people in the flood-stricken area.

Mr. Nelson was awarded the Vail silver medal for his presence of mind, resourcefulness and courage in rescuing a fellow employe from death by contact with a high-voltage electric current.

Wading into a swiftly-flowing stream until its icy water reached his armpits, in order that he might restore communication between the city's water supply station and its filtration plant, Mr. Stine performed an act which was recognized as being of noteworthy public service.

Miss Wilson was awarded a medal for her courage and presence of mind in the face of grave danger. With the revolver of a yeggman levelled at her head, she calmly notified the president of the local bank of an attempt to rob its vault, called the deputy sheriffs in the nearby towns and instructed them how they might reach the village by the nearest and quickest route.

Now In Its General Headquarters and Administration Offices.

The New York Telephone Co. early this month completed the removal of its general headquarters and administration offices to the new telephone building at 140 West street, New York.

The building, with its 31 stories and five sub-basements, now houses over 6,000 telephone employes who moved with their goods and chattels from 17 other company-owned or leased buildings, scattered throughout New York City. The migration has been under way since last February.

Passing of Last Magneto Exchange in London, England.

The "Bank" telephone exchange in London, England, rang its own death knell on Saturday, June 5. It was the first London exchange to be fitted with a multiple switchboard, and the last to be worked on the "magneto" principle.

In point of numbers, the Bank was the smallest of the London exchanges, having less than 1,000 subscribers, who have now been transferred to the Central exchange.

Northwestern Bell Staff Changes in Nebraska and South Dakota.

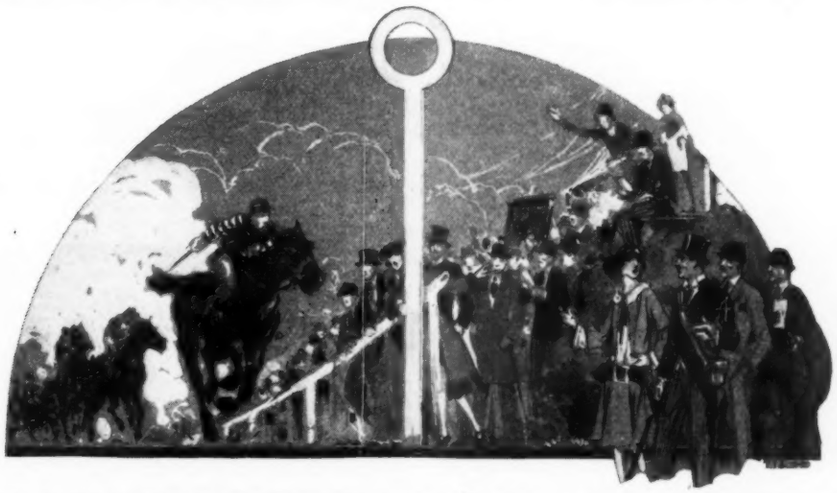
O. H. Gentilly, district chief clerk of the Northwestern Bell Telephone Co. at Chadron, Neb., has been made manager at Yankton, S. D., succeeding W. D. Kauffman, who has been transferred to Rapid City, S. D. Another change announced is the promotion to the office of division commercial supervisor at Omaha of Harlan L. Fentress, who has been a supervisor in the commercial results and practices department.

J. W. Walton Buys Fairfax (Okla.) Telephone Exchange.

The Fairfax Telephone Co., operating some 500 telephones at Fairfax, Okla., and vicinity, has been sold by H. S. Morgan to J. W. Walton, of Broken Arrow, Okla., the new owner having assumed charge of the plant on June 1. Mr. Walton owns and operates telephone exchanges at Stroud, Broken Arrow and Hominy, Okla.

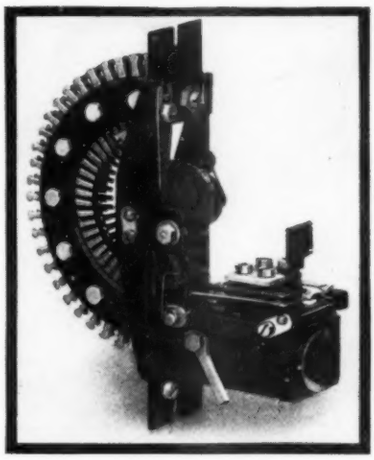
It is stated that Mr. Morgan will spend the summer in California for his health.

A·T·M (STROWGER) LEADS IN GREAT BRITAIN



THE FAVOURITE WINS AT EPSOM

EPSOM is annually thronged by a crowd of enormous proportions, bent on witnessing the Classic events of the English turf—the "Oaks" and the "Derby."



Established nearly a century and a half ago, these two famous races have served to prove the mettle of generation after generation of thoroughbred horses. To win the "Derby" in particular has been to secure the much coveted Blue Riband of the turf. In much the same way as the horses are entered for the "Derby", A. T. M. (Strowger) Automatic Telephony was selected for the first public Automatic Telephone Exchange in Great Britain, with a view to determining its possibilities. One of the many advantages of the A. T. M. (Strowger) system is the untiring ability with which it handles exceptional telephone traffic on such occasions as Derby Day.

That the initial A.T.M. (Strowger) equipment supplied by Automatic Telephone Mfg. Co., Ltd., for Epsom in 1912 has since been vastly increased; that similar equipment has also been installed in numerous other public exchanges and is planned for hundreds more; and that the system has been standardized by the British Post Office for London and the Provinces are "tips" being generally followed by Telephone Administrations the world over.

STROWGER AUTOMATIC TELEPHONY

MAX ATM

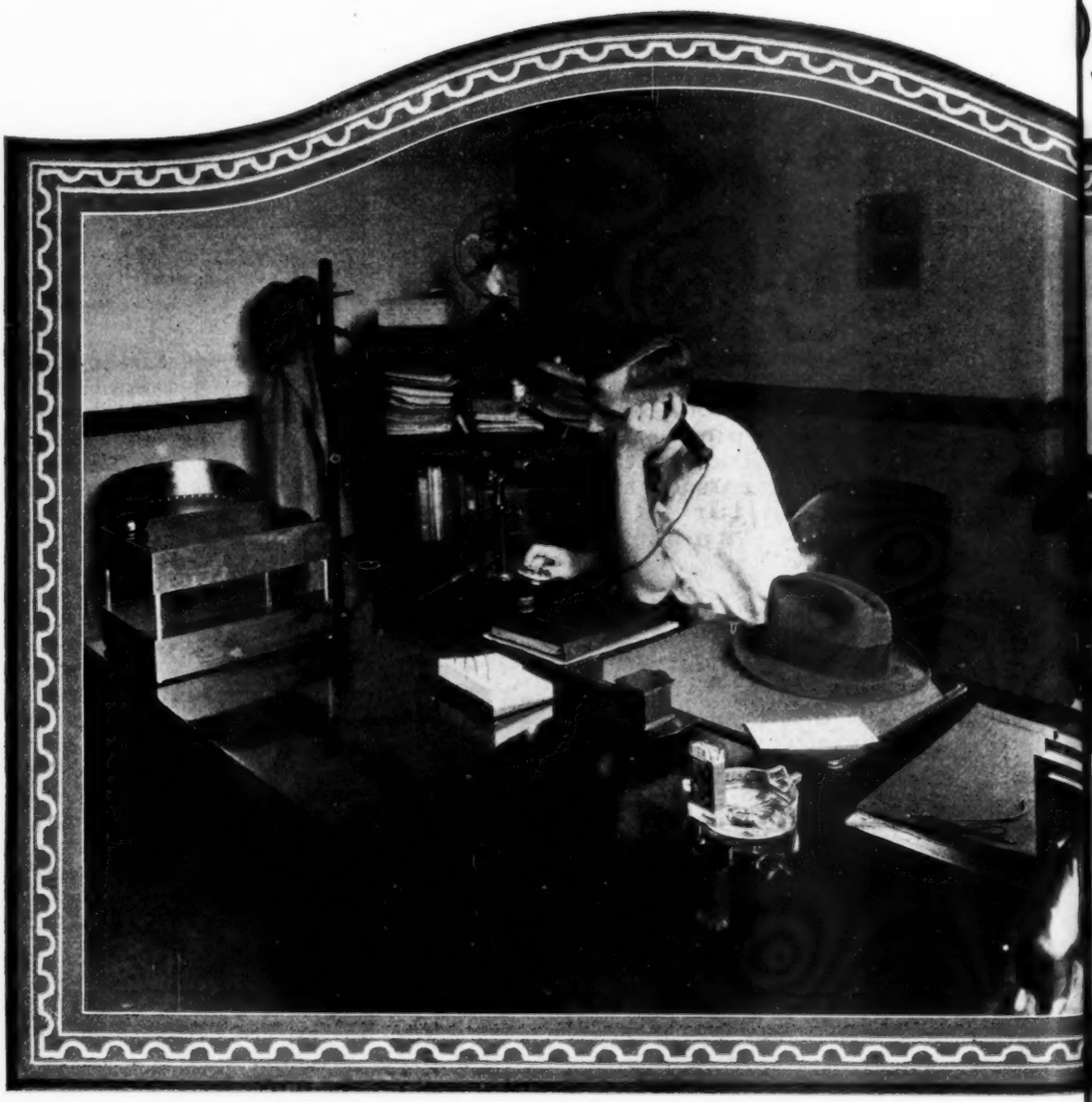
The System · The Operator · The Symbol

AUTOMATIC TELEPHONE MANUFACTURING COMPANY LTD

HEAD OFFICE & WORKS
MILTON ROAD · EDGE LANE
LIVERPOOL

LONDON OFFICE
NORFOLK HOUSE · NORFOLK ST
STRAND · W·C·2

ENGLAND



With Strowger Automatic operat
troubleman is his own test d
merely dialing the proper re
numbers, he makes his own "
tests without assistance.

trowger Automatic Equipment offers Unequalled Facilities - - -

For Saving the Troubleman's Time

As important as any tool in the troubleman's kit, are the testing facilities placed at his disposal when Strowger Automatic equipment is used.

By means of the ever-ready dial, his tests are completed more accurately and in but a fraction of the time formerly required.

Any desired connections, including all "ring-back" tests, are made instantly and without the aid of any other employees.

STROWGER AUTOMATIC

Automatic Electric Inc.

Factory and General Offices; 1033 W. Van Buren St.
Chicago, U. S. A.

When writing to Automatic Electric Inc., please mention TELEPHONY.

1926 Directory Well Received

"Telephony's" Directory of the Telephone Industry for 1926 Highly Valued by Operating Companies in the Field—Letters from Prominent Companies Say it Is "Very Complete and Reliable", "Indispensable", "The Best Yet"

Five thousand copies of the 31st annual edition of TELEPHONY's "Directory of the Telephone Industry" were distributed to the telephone field three weeks ago. The new book, which records all the commercial telephone companies in the United States, its possessions and Canada, operating 50 or more stations, or a switchboard, and gives their respective location, sizes and the purchasing agent of each company, shows convincing evidence how the Independent telephone field is developing. Four hundred and fifty new companies, the records show, have been listed since publication of the 1925 Directory.

The 1926 directory, as in previous editions, also catalogs a complete list of the exchanges of the various Bell associated companies, and important information as to the headquarters and officers of the national and state telephone associations, as well as the state commissions having jurisdiction over telephone and other utilities.

Other listings include a buyers' and classified index for the reference of the purchasing department of telephone companies, and advertisements appearing throughout the book call attention to the foremost manufacturers and jobbers of telephone supplies.

In view of the 50th anniversary of the telephone this year, a section of the directory is devoted to an interesting and accurate account of the relative annual increase in the use of the telephone and to a record of the improvements contributed to the field by Independent inventors.

Below are a few of the many testimonials which have been received and show with what interest and favor this edition of the directory has been received by prominent telephone operating companies throughout the country:

"I desire to thank you for the copy of TELEPHONY's 1926 Directory of the Telephone Industry, which was received June 1.

I took the time, immediately upon its receipt, to examine it thoroughly, and I wish to congratulate you upon this issue of the directory. It is one of the best, if not the best, copy yet issued. I think I have in my files a copy of every issue that has been printed.

It contains a storehouse of information for all telephone men, from the ground toll lineman to the president's office. Information along almost every line is at your finger tips. I thank you for the copy you mailed me.

We cannot get along with one copy of this directory. Will you be good enough to mail me two extra copies; one for our plant and one for our commercial departments, together with bill for same, which will be appreciated."

(Signed) R. B. Babington,
Assistant Treasurer and General Manager,
Piedmont Telephone & Telegraph Co.,
Gastonia, N. C.

"I want to compliment you on your 1926 directory. We find it very complete and reliable. We use it constantly."

(Signed) Illinois Consolidated Tel. Co.,
E. A. Purcell, General Manager.
Taylorville, Ill.

"We find TELEPHONY's 1926 Directory of the Telephone Industry a very valuable reference book and of much use in our general office."

(Signed) Illinois Southern Tel. Co.,
O. M. Burgess, General Manager.
Murphysboro, Ill.

"We have received and examined your 1926 directory and wish to congratulate you upon its publication. We find it of service in our office throughout the entire year."

(Signed) Fayette Home Telephone Co.,
J. A. Sullivan, General Manager,
Lexington, Ky.

"I am glad to take this opportunity to express my appreciation of the value of TELEPHONY's 1926 Directory.

It is very useful as a medium of comparison with the different member companies, and also for the statistics it contains. I am frequently requested to give information about companies in different parts of the country by investors and others, and find it invaluable in furnishing the desired information in the field it covers."

(Signed) Joseph F. Stockwell, Executive Vice-President.
Keystone Telephone Co.,
Philadelphia, Pa.

"TELEPHONY's 1926 Directory of the Telephone Industry received. We find it a very valuable compilation—compact and useful."

(Signed) J. A. Pratt, State Telephone Co.
Madison, Wis.

"We are in receipt of the TELEPHONY's 1926 Directory of the Telephone Industry. We are pleased with its usual fine make-up. We have been receiving your directory for a number of years and find it a very useful book of reference and quite indispensable in our business."

(Signed) J. C. Joslyn, General Manager.
DeKalb County Telephone Co.,
Sycamore, Ill.

"This will acknowledge receipt of your 1926 Directory of the Telephone Industry. We find this book is a great help to us, being a ready reference covering the telephone industry in general."

(Signed) W. H. Wilson, General Manager, H. & C. Telephone Co.,
Clearfield, Pa.

"The arrangement of your 1926 Directory of the Telephone Industry is splendid. The information it contains is valuable and a help in matters of reference."

(Signed) Christian-Todd Telephone Co.,
C. E. Woodruff, General Manager.
Hopkinsville, Ky.

"Have just looked through the 1926 Directory and believe it is the best yet. I do not see how a telephone man can get along without one at his desk, as I use mine nearly every day."

(Signed) R. E. Long,
Emporia Telephone Co.,
Emporia, Kans.

"We find TELEPHONY's directory to be one of the most helpful publications which we use. On numerous occasions it has helped us locate a firm whose address we may have lost or misplaced; it is a valuable reference list for us in many ways. It is well classified and the latest issue seems complete in every detail."

(Signed) Citizens Telephone Co.,
W. R. Journey, Manager.
Higginsville, Mo.

"We have received your 1926 directory, and it certainly is one of the most complete and useful volumes that you have ever issued. We shall keep it close by for ready reference throughout the year."

(Signed) Southern Telephone & Construction Co.,
Frank D. Moor, Tallahassee, Fla.

"Our company has been a subscriber of your valuable weekly journal for many years, and we look for it in our mail every Friday as regularly as our meals.

We believe your Directory of the Telephone Industry is invaluable to any one in the business, and when a requisition comes to my desk, this is the first book I reach for. You are to be complimented

on issuing so complete a book, covering everything a telephone man wishes to know. We wish you continued success."

(Signed) Barron County Telephone Co.,
J. E. Horsman, General Manager.
Rice Lake, Wis.

"Your 1926 Directory of the Telephone Industry is a wonderful collection of facts and data that cannot be found anywhere else. I am sure that the managers of the telephone field appreciate this directory, and thank TELEPHONY in its efforts to produce this directory for our guidance.

(Signed) The Waverly Telephone Co.,
H. I. DeTurk, Waverly, Ill.

"The Directory received, and in my opinion it is very fine in structure and conciseness of information. I take great pleasure in extending my thanks and my appreciation for this volume."

(Signed) The Valley Telephone Co.,
J. H. Thompson, Lebanon, Ohio.

"TELEPHONY's Directory is very useful because:

1. It is up-to-date
2. It is reliable
3. It is a fine reference book.

It is a book all telephone companies should have!"

(Signed) A. H. Shean,
Oswego Co. Independent Telephone Co.,
Fulton, N. Y.

"TELEPHONY's 1926 Directory of the Telephone Industry was received several days ago. We find this is one of our most valuable books, and keep it on the desk all the time as we find it very handy to refer to."

(Signed) Oscar Wise,
The People's Telephone Co.,
Mt. Blanchard, Ohio.

"We use TELEPHONY's directory extensively. The 1926 edition seems to be the best yet published. We find the ads of great convenience."

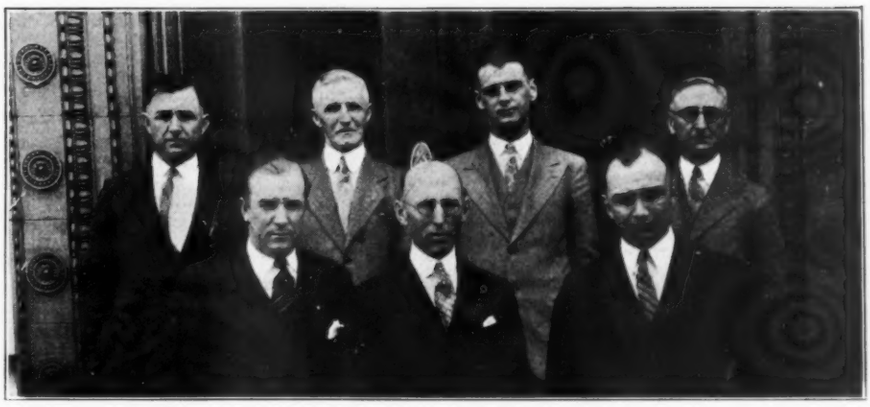
(Signed) McLeod County Telephone Co.,
Jay Greaves, President.
Glencoe, Minn.

"We value TELEPHONY's directory very highly. It contains valuable information for any telephone company, large or small. We find it is a great help to us."

(Signed) Home Telephone & Electric Co.,
T. P. Bearden, Manager,
Baird, Texas.

"We own and control some 25 exchanges and 2,000 miles toll line with a gross income above $350,000; yet we look forward to TELEPHONY's directory and even though busy we take time to notice all the advertising section."

(Signed) Crosbyton Telephone Co.,
E. H. Hendricks, General Manager,
Crosbyton, Texas.



Executives of the Lincoln (Neb.) Telephone & Telegraph Co.—From Left to Right, Top Row: F. E. Behm, District Manager, Lincoln; Charles G. Bennett, District Manager, York; Lyle P. Young, District Manager, Hastings; W. H. Caman, District Manager, Beatrice—Bottom Row: C. W. Motter, Publicity Director, Lincoln; W. E. Bell, Commercial Superintendent, Lincoln; H. F. McCulla, Commercial Engineer, Lincoln.

"TELEPHONY's Directory of the Telephone Industry for 1926 has been received. In our opinion it is very fine, and we want to thank you for it. We have been receiving the directory from year to year, and find it very handy for reference."

(Signed) Clarke County Mutual Tele. Co.,
O. R. Shaw, Secy., Osceola, Iowa.

"We get a great deal of information during the year from TELEPHONY's directory, and, while we are not large buyers of material, we find the list of advertisers very valuable."

(Signed) Story County Independent Telephone Co.,
Nevada, Iowa.

"We received a copy of your 1926 directory and wish to thank you kindly for it, as we would not feel that our supply of information was complete without a copy of this handy book.

We have frequent use for it. Many thanks."

(Signed) Lebanon Telephone Co.,
Lebanon, Ind.

"The information and statistics compiled in your 1926 Directory of the Telephone Industry are very useful, and thoroughly demonstrate the magnitude and stability of the industry.

Purchasing agents will also find the buyers' and classified indexes of value to them."

(Signed) Coos & Curry Telephone Co.,
Earl W. Gates, Superintendent,
Marshfield, Ore.

"TELEPHONY's 1926 directory is very complete and much improved over former issues. We find its advertising also very reliable, and well worth patronizing."

(Signed) People's Mutual Telephone Co.,
Walter P. McLean, Hillsboro, Ill.

"The 1926 directory is very good and a handy book for the telephone man. I would feel it a big loss not to have it on hand. By all means it should be issued every year so as to keep everyone informed on changes, both in operators and dealers."

(Signed) Garden Valley Telephone Co.,
Thos. Vollom, Erskine, Minn.

"Your directory comes in very handy quite often when looking for a firm handling some certain article, or when looking for a man's name or initials as an officer of some company."

(Signed) Belvidere Telephone Co.,
R. E. Putman, Manager,
Belvidere, Ill.

"We have received TELEPHONY's 1926 directory and appreciate it very much, as it is a guide to dependable supply companies. It is also interesting to note what other telephone companies are doing each year."

(Signed)
H. H. Cottingham, Superintendent,
Greenfield Telephone Co.,
Greenfield, Ind.

Iowa Tornado Damages Telephone and Electric Lines at Clarinda.

A tornado struck Clarinda, Iowa, on June 16, wrecking a number of homes killing two persons and injuring about a dozen persons. It caused a property damage estimated at $150,000.

The tornado, traveling in a north-easterly direction, struck in the southeast section of the city, blowing away one of the towers of radio station KSO and part of the building that houses the station. The estimated damage to the telephone and electric light properties is placed at $15,000.

Dates Fixed for Annual Convention of Indiana Association.

The annual convention of the Indiana Telephone Association will be held at the Claypool Hotel, Indianapolis, Ind., on Tuesday, Wednesday and Thursday, September 21, 22 and 23. Exhibitors and guests are urged to make their reservations early.

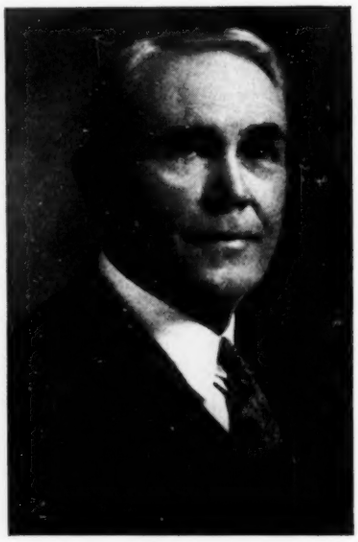
Personal Notes From the Field

J. E. Armstrong, of Russellville, Ark., president, Arkansas Independent Telephone Association, was born in the good old state of Virginia, at Richmond, December 6, 1860, about the time our country was in the throes of slavery. He was educated in the schools of Tennessee where his folks moved after the war.

At an early age he became interested in steamboating and secured special license as engineer on small boats in 1878. A few years later he became chief engineer on Mississippi river boats. With the decline of river traffic, he helped to promote and erect a number of the first electric light plants and ice factories in West Tennessee and Eastern Arkansas.

His first experience with the telephone was in 1888. He purchased two telephones, with Blake transmitters; installed one in Dyersburg, Tenn., and the other seven miles in the country, using No. 10 steel wire, porcelain knobs, wired to trees. In talking it was necessary to close the doors to avoid disturbing the neighborhood.

In 1899, he became interested in two exchanges at Forrest City and Marianna, Ark., but soon disposed of his interest in these and took charge of some property in Southeast Missouri, consisting of three



J. E. Armstrong of Russellville, Ark., President of the Arkansas Telephone Association.

exchanges. The following ten years this property was developed to 25 exchanges with 300 miles of toll lines extending over nine counties. He remained as general manager until the property was sold.

In 1911 the Bell Telephone Co. of Missouri (later Southwestern Bell Telephone Co.) purchased the Southeast Missouri Telephone Co. He remained in charge of this property until the Bell company was reorganized, when he was made district manager.

In 1919, Mr. Armstrong purchased the Russellville Telephone Co. and later acquired the local interest of the Southwestern Bell Telephone Co. He immediately consolidated this property and later bought the Atkins exchange. Most of this property was in a rundown condition with inadequate rates. In 1924, he increased the rates without loss of a subscriber and rebuilt the exchanges. He now has a five-position Stromberg-Carlson feature board, full cable plant and all creosoted pine poles. The number of subscribers is about doubled.

Mr. Armstrong is serving his second term as president of the Arkansas Telephone Association and has this to say about that organization:

"We feel that this organization has done much in reconstructing and building up telephone conditions in this state. Its officers have at all times been closely in touch with state legislation pertaining to the telephone business.

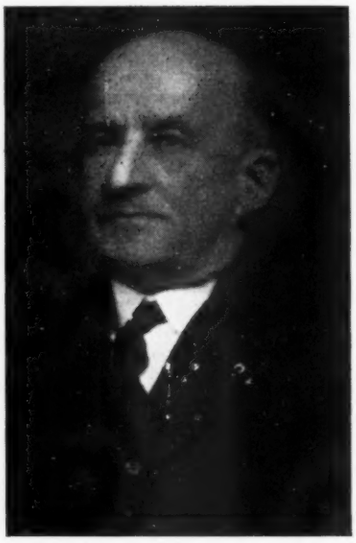
The primary policy of our association has at all times been to build up and maintain cordial relations with the public and rate regulatory bodies. In other words, our motto is 'fair, equitable, and courteous dealings to the other fellow.' Our association works hand in hand with the Bell people, who have at all times rendered us the most courteous and beneficial assistance."

J. E. Horsman, recently elected vice-president of the Wisconsin State Telephone Association, is secretary and general manager of the Barron County Telephone Co., Rice Lake, Wis., with exchanges both at Rice Lake and Barron, Wis.

Born in Guelph, Ont., Canada, August 5, 1861, Mr. Horsman received his education in the public schools and Trinity College School of Port Hope, Ont. For a period of 14 years he was employed as traveling salesman in Northern Wisconsin for the Marshall-Wells Co., with headquarters at Duluth, Minn.

Mr. Horsman has held several public offices in the city of Rice Lake at different times. He is a member of the Rotary Club, all Masonic bodies, the Elks and U. C. T.

Mr. Horsman's connection with the telephone business dates from 1900, when he became a stockholder in the Barron County Telephone Co. In 1904 he became local manager of the Rice Lake exchange, and in February, 1922, he was elected secretary and general manager of that system. These positions he continues to fill, to the satisfaction of the public, as well as the stockholders, having put his company on record as one of the most economically-



J. E. Horsman, of Rice Lake, Newly-Elected Vice-President of the Wisconsin State Telephone Association.

managed and best-paying of the smaller telephone properties in the country. The Barron County company is operated strictly on a cash basis. "We don't owe a dollar and nobody owes us," says Mr. Horsman.

Keen interest has been taken by Mr. Horsman in district meetings of the Wisconsin State Telephone Association, a particularly active part having been taken by him in those held at Rice Lake, September, 1924, and October, 1925.

When asked to state his particular hobby his reply was, "Limiting conversations on party lines to five minutes."

In last week's issue of TELEPHONY, containing a report of the recent convention of the Wisconsin State Telephone Association, an endeavor was made to present Mr. Horsman's likeness. To our surprise and amazement, upon receiving copies of the issue from the printers we were greeted by the countenance of J. E. Armstrong, president of the Arkansas Telephone Association instead of Mr. Horsman's. The photographs of both Mr. Horsman and Mr. Armstrong, however, are presented on this page, with the proper designations.

Sergius P. Grace, commercial development engineer of the Bell Telephone

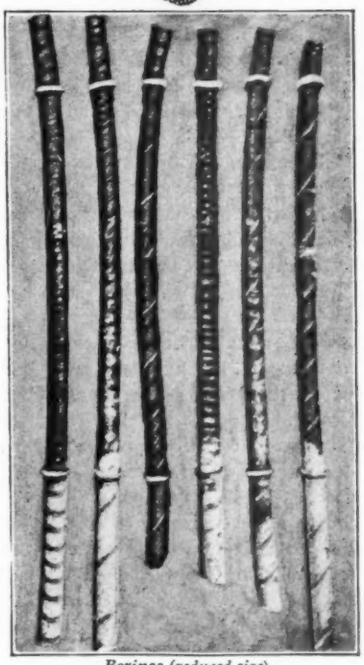
2T6

IMMUNE to Termites and to Decay

Low Cost Per Pole Year: The relatively low cost of Texas "Black Beauty" Poles; their great natural strength; their high degree of resistance to wind and sleet storms, and to all forces which cause decay or loss of bearing strength; and their long service life without need for attention or any up-keep cost whatever, make them the ideal carrier for telephone lines.

Smaller Poles with Equal Strength: The high modulus of rupture of Southern Yellow Pine is well known. Tests made by the U. S. Forest Products Laboratory show that it rates highest among the woods which are suitable and commercially available for poles.

Strength Continuous: Nature gives Texas "Black Beauty" Creosoted Southern Yellow Pine Poles great initial strength. And scientific creosoting by the vacuum-pressure method in our modern and efficient plant, makes the wood chemically inert, and preserves this strength for generations, by making these poles immune to the effect of acid soils, the attack of termites, decay-producing fungi and the other forces which tend to weaken untreated poles of all species—either below, at, or near the ground line.



Borings (reduced size)
Note Great Depth of Penetration of the Preservative Oil.

Obvious Saving Due to Strength: It has been shown that you can, with safety, use smaller size Creosoted Southern Yellow Pine Poles and longer spans in carrying a given load than is practical with any other species. This is a distinct economy.

Penetration: The length of time that creosoted poles will defy the forces of decay is in direct proportion to the depth and uniformity of penetration of the preservative oil.

Proof: In treating Texas "Black Beauty" Poles, *we strive for complete penetration of the sapwood.* Borings are the best evidence of the quality of the treatment of creosoted materials. In order that we may be certain that we are getting the desired results, borings are taken from every cylinder "run." These are available to the purchaser, and inspection is invited.

Lower Operating Costs—More Dividends: Texas "Black Beauty" Poles are saving money for many users. They will save money for you, by reducing to the minimum your upkeep cost per mile, per year. Those who use them say that they are "unbeatable."

Action: We have a stock of very fine poles on our sand-filled yards, and can make prompt shipment in almost any size or quantity desired. Let us quote on your needs. Shipment can be made either by water or rail.

Texas Creosoting Company

Main Office and Plant: Orange, Tex., U. S. A.
MONARCH TELEPHONE MFG. CO., *Agents*
Chicago, Illinois

Texas "Black Beauty" Poles

When writing to Texas Creosoting Co., please mention TELEPHONY.

Laboratories, New York City, was recently elected president of the New York Electrical Society. The organization, which has nearly 1,000 members, follows the policy of interpreting to the layman the newest things in science and discovery by means of meetings at which such achievements are shown and explained.

The presidency comes to Mr. Grace in recognition of his contribution, as chairman of the program committee, to the society's most successful season. Mr. Grace is well known in telephone circles, having been connected with the industry for 30 years in both Independent and Bell fields.

C. B. Cheadle of Joliet, Ill., recently suffered severe injuries, due to the overturning of an automobile in which he was riding. He is now out and resuming his many activities. At the time of the accident, Mr. Cheadle was traveling in connection with a drive for funds by the local Y. M. C. A.

Charles E. Dobbs, formerly of Conover, Wis., has assumed the management of the Three Lakes (Wis.) Telephone Co., in which he recently acquired a large interest.

S. H. Spitler, of Stanley, Va., has been elected secretary and manager of the Page Farmers Mutual Telephone Co., of Luray, Va., succeeding F. S. Hershberger, who resigned some time ago.

Miss Edna Daniels, a telephone operator at Hershey, Neb., was selected the other day as the high school girl to represent the state of Nebraska at the Sesquicentennial now in progress in Philadelphia. Each state has been asked to select one boy and girl of high school age, of outstanding qualities of leadership and whose ideals of American youth best represented those of her school and of the student body generally. The object was to reward these qualities by giving each a trip to the Sesqui-centennial, with all expenses paid, the boy and girl chosen by the students themselves, with a teacher selected by a general committee as their chaperon.

Miss Daniels was selected by the vote of all the candidates for the honor. These met in convention in the governor's office, and there their qualifications were read. Balloting was begun, the low ones being dropped on each ballot, until on the final one Miss Daniels was chosen. She had been sent first by her own school.

Her selection is a matter of great pride to the telephone people of Nebraska. Miss Daniels is a young woman of grace and beauty, as her portrait will attest. This picture was made especially for the telephone people.

She comes from a family of modest means, and it was necessary for her to make her own way through school. To do this she worked 11 hours each night in the Hershey office as night operator, which means that she answered calls until the

Miss Edna Daniels, Night Telephone Operator at Hershey, Neb., Selected to Represent State of Nebraska at Sesqui-centennial in Philadelphia.

regular hour of closing, and after that was subject to being waked up out of sleep to care for emergencies. In the day time she attended school. During vacation she worked in a doctor's office, and for a time was a substitute teacher. She makes all her own clothes.

Obituary.

George H. Rymers, vice-president and for many years secretary and treasurer of the Northern New York Telephone Corp., Plattsburgh, N. Y., died at the Physicians' hospital, Plattsburgh, June 7 after a short illness.

Mr. Rymers was born in the country near Elmore, Ohio, August 24, 1868. He attended district school and then Elmore High School. After finishing there he entered Hiram College, Hiram, Ohio, from which he graduated with the class of 1891.

He began work for the Croghan Bank & Savings Co. of Freemont, Ohio, in August of that year, being the first employe of the bank..

In Freemont Mr. Rymers was prominent in social and fraternal matters, Chamber of Commerce and politics. In 1897 he was elected treasurer of the Fremont Home Telephone Co. and had been in the telephone business since. In the bank he occupied various positions and was assistant cashier when he left for Albany, N. Y., in April, 1906.

There he was engaged in the formation of various telephone companies, one of which was the Mountain Home Telephone Co. of Saranac Lake. This company was afterward enlarged and the name changed to Northern New York Telephone Corp. He was the first secretary and treasurer of the corporation. In May 1925 he was elected vice-president. He was also a director of the Merchants National Bank of Plattsburgh.

Mr. Rymers was a member of the Independent Pioneer Telephone Association of the United States. Fraternally he had been prominent in Masonic circles, having been master of Brainard Lodge, commander of Fremont Commandery, and master of the Tyrian Council of Plattsburgh, and recognized in the Grand Council of New York state by various appointments.

Mr. Rymers was always ready to help in any thing for the good of the community in which he lived. He was a member of the Chamber of Commerce of Plattsburgh and also of the board of trustees of the public library.

That Mr. Rymers had made a place for himself as a citizen of Plattsburgh is evident from an editorial in the local newspaper, The Clinton County News, which said among other things:

"In the passing of George H. Rymers, Plattsburgh has lost a citizen, who although a comparatively newcomer, has since taking up his residence here been an active worker in every undertaking for the growth and development of this community.

Mr. Rymers was a quiet unassuming man who never forced himself into the limelight but was ever ready to do his part in any undertaking. Coming here from Ohio at the time the present organization took over the telephone interests of this section, Mr. Rymers has since held the responsible position of treasurer of the Northern New York Telephone Corp. This is a most exacting position requiring patience and tact, both of which Mr. Rymers had to a remarkable degree, and yet he found time to devote to public affairs, and his services were always readily accepted. He was one of the most active workers during the various Liberty loan campaigns in this city and through his efforts in no small degree they were eminently successful.

In the death of George H. Rymers, Plattsburgh has lost a good citizen and the Northern New York Telephone Corp. a tried and trusted official, one who could always be depended upon to look after the interest of the organization of which he was a part, and do so in a manner which won for the organization new friends.

No community can afford to lose a citizen of the character and standing of George H. Rymers. His every-day life was an asset to Plattsburgh and when, as he frequently did, he put forth special efforts for the success of movements in which he took a deep interest, he added not a little to their success. Plattsburgh mourns the death of George H. Rymers, always a good citizen and true friend."

In addition to his widow, two children, Howard and Mary Rymers, survive Mr. Rymers, as does his father, Henry Rymers, who is 86 years of age, and one brother, Robert Rymers, both of Elmore, Ohio.

LABORATORY test results on Columbia Gray Label Telephone Dry Cell economy surprise everyone who sees them unless they have used these surprisingly long-lasting batteries. So we suggest just this: Order a barrel and put them in service. Let them prove for themselves that their longer shelf life means less cost per month of service. Fahnestock spring clip binding posts at no extra cost.

Manufactured and guaranteed by

NATIONAL CARBON COMPANY, Inc.
New York San Francisco
Canadian National Carbon Co., Limited, Toronto, Ontario

Columbia
Telephone Batteries
Best by test—they last longer

When writing to National Carbon Co., please mention TELEPHONY

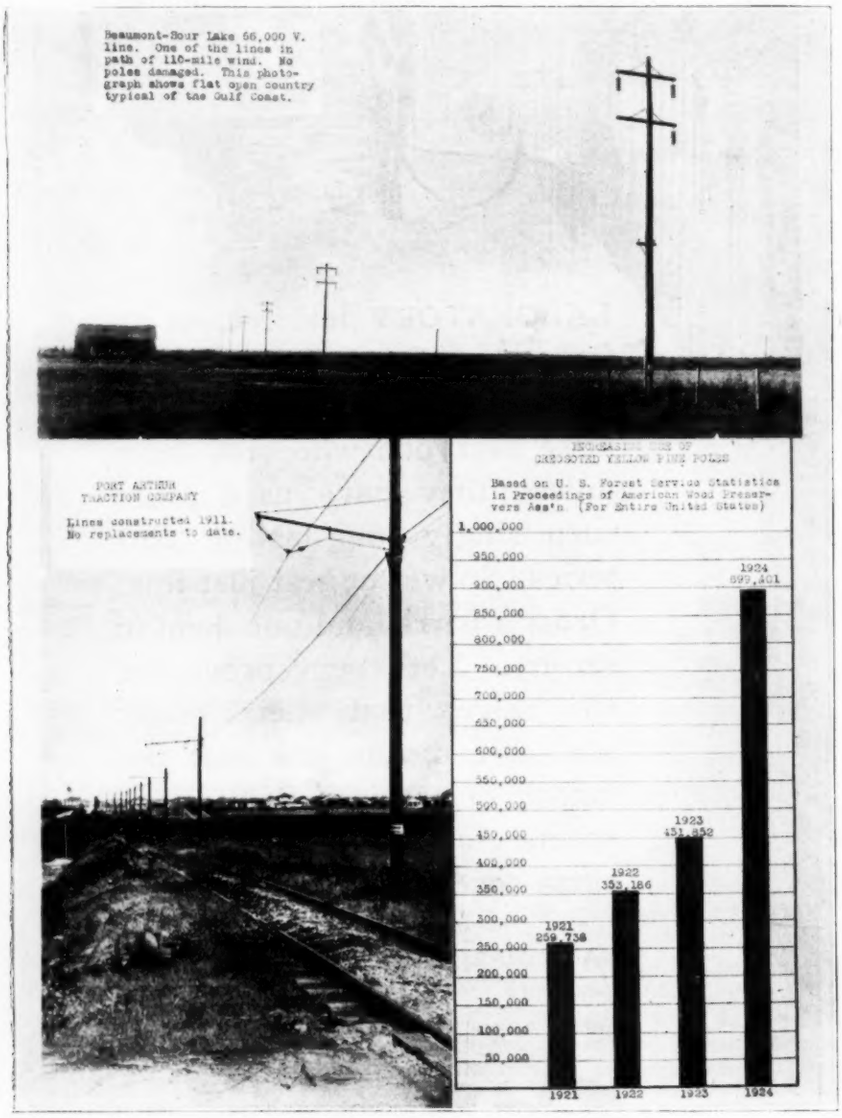
Some Data on Creosoted Pine Poles

Experience of Eastern Texas Electric Co. with Creosoted Pine Poles—Data on Qualities and Characteristics of These Poles—Presented at Sixth Annual Convention, Southwestern Division, National Electric Light Association

By H. E. Braunig,
Eastern Texas Electric Co., Beaumont, Texas

In recent years there has been a marked expansion in the use of creosoted pine poles throughout the entire country. A quite thorough knowledge of these poles has developed through the studies that accompanied this increase, and answers possessing a high degree of accuracy are available to questions regarding their service. This paper endeavors to present these recent studies in summarized form. The sources of data are given in the accompanying bibliography. The writer also cites actual experiences of the company, with which he is connected, in the use of creosoted pine poles in various types of service over a period of 15 years.

"Treated" pine poles is taken to mean "creosoted" pine poles, inasmuch as no preservative other than creosote is of commercial importance for pine pole preservation.



Photographs of Lines of Creosote Treated Yellow Pine Poles That Have Seen Many Years of Service and Data Showing Increased Use of Creosoted Yellow Pine Poles.

Strength of Creosoted Pine Poles

Strength is mentioned first because of its importance in line construction and because it is an outstanding characteristic of creosoted pine. The most recent authoritative strength tests on wood poles were those conducted by the American Telephone & Telegraph Co. in 1924.[1] The United States Forest Products Laboratory issued a bulletin on the same subject in 1923.[2] The most comprehensive discussion of the whole strength subject is given in Department of Agriculture Bulletin, No. 556.

Our experience with creosoted pine began in 1911. Three years ago we adopted it exclusively. In general, we now use all poles one inch less in top diameter than formerly when other species were used.

All evidence indicates that as long as the wood is preserved against decay the original strength is undiminished. Tests, some of which were made during the last 18 months, on creosoted pine poles 27 years old showed no decrease.

We had a striking example of the strength of the poles at Beaumont on March 30, when a cyclone hit in that vicinity. The wind attained a velocity of 110 miles an hour and, due to the flat open country, there was nothing to break its force. Damage of all description within the city limits of Beaumont alone amounted to one-half million dollars. Our properties were in the midst of this storm and although a great many wires and some 60 odd poles were broken, there was not a single broken creosoted pine pole—this in spite of the fact that some of the lines were installed as far back as 1911, and were in the direct path of the storm.

One section of our Beaumont-Liberty 66,000-volt transmission line was in the direct path of this storm and at right angles to it. Although some of these poles were blown over to an angle of approximately 40 degrees, and some of the conductors broken, due to the lack of guys, there was not a single broken or split creosoted pole in this section. This line is constructed of 55-foot creosoted poles, and a section of it is shown in the accompanying photograph.

We feel that this was entirely due to the strength of the creosoted poles, inasmuch as practically everything in the path of the storm, which blew approximately 110 miles an hour in this section, was wrecked; trees being uprooted and twisted, and houses being demolished.

The life of creosoted pine poles has

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Some of the equipment has been dismounted, but it is all in good condition.

THE NORTH ELECTRIC MANUFACTURING COMPANY

Galion, Ohio

been variously estimated as from 25 to 40 years. The Pennsylvania Electric Association, overhead systems committee report, 1923[3], gives the anticipated life as 35 years. A recent paper by the Carolina Light & Power Co., "Characteristic and Cost Data," attributes a life of 40 years.

Life of Creosoted Pine Poles.

One of our oldest lines, between Port Arthur and Beaumont, was built in 1912. In its construction 652 poles were used. To date, three of them have been replaced due to decay caused, as far as can be determined, from abrasions, there being practically no decay at the ground line or top. Following the recent storm various sections of this line were examined and found to be in splendid condition at the present time.

A lien between Dallas and Sherman, Texas[5], built in 1909, and containing 2,400 poles, has never had a replacement.

Poles in a test line placed by the A. T. & T. Co. in 1898 are in use today, and the latest published report states that there are less than 10 per cent replacements. When, recently, it was decided to remove some of these 27-year old poles to determine their strength, officials of the company made this comment ". . .. these poles would have given at least 35 years' service in their former location, where on the Gulf Coast they were exposed to the most severe conditions possible."[6]

In examining these old lines, the outstanding fact is that the poles are apparently about as good as they ever were. The wood is preserved by the creosote and as long as this wood stays sound there seems to be no deterioration.

It might also be pointed out here that the foregoing deals with poles which were treated 15 to 30 years ago. The science of timber preservation, like other sciences, has advanced during these years. There is no doubt that the present-day application of the treating process is better regulated and more scientifically handled, and that the quality of the preservative oil is better controlled than ever before. Knowing this, it seems safe to assume that the treated pole itself is an even better product than we have heretofore obtained.

Conductivity.

The overhead systems committee of the southwestern division of the N. E. L. A. presented its report at the 1922 meeting. The summary of that report is presented below along with the conclusions from two more recent studies on the same subject. One was made in 1923[7] by the conductivity committee of the American Wood Preservers' Association, and the other, on the use of joint poles, represents a study made in 1924 by the Southwestern Bell Telephone Co.

Summary of 1922 N. E. L. A. Committee Report.

The conductivity of creosoted poles appears dependent on these factors:

Amount of moisture in poles if same is over 18 per cent.

Period of seasoning after treatment.

Percentage of turpentine and rosin left in poles when treated, if any.

The hazard to the lineman is reduced (for voltage under 6,600) when the creosoted pole has been allowed to season for 90 days or more after treatment.

It is to be noted that conductivity of these poles varies somewhat with the moisture content.

It is also interesting to note that the dry, untreated pole shows about the same results as the treated pole immediately after treatment.

This committee suggests that methods of seasoning poles after treatment be provided which will give the same results as allowing the pole to season in the yard for two months or more.

Summary from American Wood Preservers' Association Conductivity Committee 1923.

POLES: Your committee has decided that for all practical purposes the conductivity question as related to poles holds no interest for the following reasons:

1. The distribution engineer is concerned with insulator and crossarm resistance, the pole resistance forming but a small fraction of the circuit to the ground.
2. Creosote is the preservative in general use for pole preservation, and the experimental data show that it increases resistivity of timber.
3. Steel poles and crossarms are in common use on transmission lines.

Summary of Southwestern Bell Report 1924.

The question is sometimes raised as to whether untreated poles are more suitable than treated poles for joint use with electric companies. This bulletin indicates that pole resistances are lowest when the pole surfaces are wet, and that under these conditions the resistances of treated and untreated poles are approximately the same.

For these reasons, it is felt that, as far as safe operating conditions and safety to linemen are concerned, treated poles are as satisfactory for jointly-used lines as untreated poles.

White Ant and Woodpecker Attacks.

On the Gulf Coast white ants are a serious problem, for the reason that they are one of the most virulent wood destroyers and, once they begin work on a pole, nothing can save it. It is not uncommon for them to completely riddle an untreated pole of any kind in a year.

Experience to date has shown creosoted pine as the only pole that successfully withstands their attack for a long period of time; and this is due, not to the wood itself, but solely to the fact that the method of treatment forces the creosote deeply into the wood.

An example of the seriousness of these attacks was brought out in the recent cyclone at Beaumont. Some untreated poles on our Pine Street power lead broke during the storm—a creosoted pine pole stopped the break. When we examined these broken poles, we found them completely hollowed out at the ground line—the work of white ants. They were installed less than four years ago. This has been quite a common experience in Beaumont in the past 10 years.

The government publication, "Tests of Methods of Protecting Wood Against Termites or White Ants" recommends creosote as the best preservative, saying:

"The most effective preservative in protecting timber to be set in the ground from attacks by termites is coal-tar creosote . . . . . Impregnation by the full cell process with coal-tar creosote renders wood resistant for at least 25 years."

Regarding Woodpeckers.

Woodpeckers are not numerous in many sections of the Southwestern territory. There are places, however, where they do serious damage, weakening poles both by the removal of wood, and by making pockets which hold moisture and promote decay. It is sufficient simply to say that experience has shown the creosoted pine pole highly resistant to these pests.

Fire Resistance.

The literature on the fire hazard of creosoted wood contains two outstanding references. One was published in 1924 by the American Railway Bridge & Builders Association[9] and the other an older one, by the National Fire Protection Association.[10]

Both show that creosoted wood when new is more readily inflamable than untreated wood, but that when it becomes older it is less inflamable than untreated wood. On the whole, both studies conclude that creosoted poles, and creosoted timber in general, are less subject to damage by fire than untreated wood.

This fire-resisting quality has been explained on the basis that, when creosoted wood is ignited, a chemical decomposition of the creosote takes place during the burning. This decomposition deposits a protective coating of carbon on the wood and to some extent protects it.

Statistics.

Statistics compiled by the U. S. Forest Service show twice as many creosoted pine poles used in 1924 as in 1923, with the result that more of them went into service during that year than poles of any other kind. Though the government's figures are not available for 1925, all evidence indicates that this rate of increased use prevailed during that year.

The vast majority of these poles were treated by the 8-lb. Rueping empty-cell process, the 12-lb. Bethel full-cell process and the Lowry-empty-cell process. These three methods are practically the standards.

Cost.

It is not possible to give definite figures on cost, due to the fact that each of the companies that have made cost studies have based their figures on specific conditions applying only to themselves; that is, freight rates, installation and labor costs, climatic conditions affecting antici-

pated life, etc., all of which are necessarily different for each company.

Two comparative cost studies have been made in the last 12 months, one by C. V. Merriam,[12] engineer of the Eastern Texas Electric Co., and another by the Carolina Light & Power Co.[4] Each of these show creosoted pine as having a decidedly lower annual cost than that of other poles.

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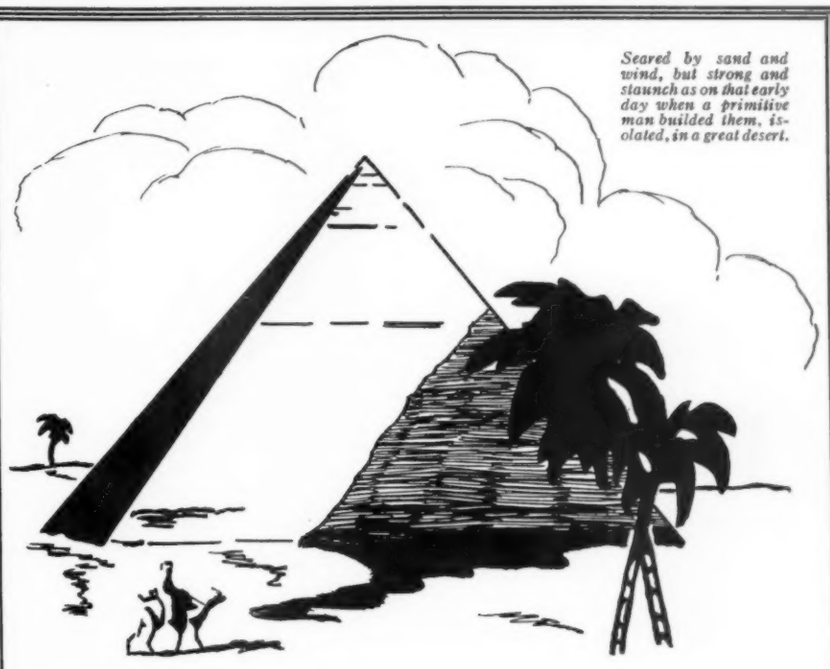
[12]Report on the Suitability of Concrete Poles for Use by Light, Power and Street Railway Companies. By C. V. Merriam, Eastern Texas Electric Co., Beaumont, Tex.

University Honors Arthur Bessey Smith: It's "Dr. Smith" Now.

At the commencement exercises of the Northwestern University held on July 15, Arthur Bessey Smith, chief research engineer for Automatic Electric Inc., was awarded the degree of Doctor of Philosophy.

The degree was conferred as a result of the work which Dr. Smith has done during the last two years in investigating the properties of the slow-acting relay and its component parts. The results of the investigation were submitted to the examining board in the form of a thesis entitled, "An Experimental Determination of the Space and Time Distribution of Foucault Currents in a Cylinder, and the Release Time of a Relay Armature."

Dr. Smith has been associated with the art of telephony for many years; first as practical telephone mechanic, then as instructor in telephone engineering at Purdue University, and later as head of the research department of Automatic Electric Inc. He is widely known among telephone men as the co-author with Wilson Lee Campbell of "Automatic Telephony" as well as being the author of numerous technical papers which he has presented at various times before different engineering and technical societies. For many years


Seared by sand and wind, but strong and staunch as on that early day when a primitive man builded them, isolated, in a great desert.

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he was a frequent contributor to TELEPHONY's columns.

Automatic Electric Inc. is known throughout the world as being largely responsible for the great advances made in recent years in automatic telephony, and no little portion of the credit for these accomplishments should go to Dr. Smith. His friends and associates, both within and outside of the company, will be glad to hear of the honor which has been conferred upon him by Northwestern University, and to congratulate him upon this well-merited distinction.

Personal.

E. V. HALLIGAN, general manager of M. W. Dunton & Co., Providence, R. I., has the sympathy of his many friends in the death of his wife, which occurred June 14.

Book Review.

TELEPHONE COMMUNICATION SYSTEMS, by Royce Gerald Kloeffler. Published by The MacMillan Co., 60 Fifth avenue, New York. 284 pages, 8½ ins. by 5½ ins., 213 illustrations and diagrams. Price $4.

This is the latest volume in the engineering science series edited by Dugald C. Jackson and Earle R. Hedrick. Written by the professor in electrical engineering, Kansas State Agricultural College, the aim has been to give such general information covering the telephone field as is suitable for a text in short college courses and to give the telephone worker general information outside the particular phase of his own work.

Arthur Bessey Smith, Long Known as "Professor" Smith, Has Received the Degree, Doctor of Philosophy, from Northwestern University.

The introductory chapter briefly sketches the development of the telephone set from Bell's discovery to the present time. Principles rather than descriptions of apparatus are given. A special effort has been made to standardize circuit diagrams and to show partial circuits before treating the more complicated ones.

Following the introductory chapter, the transmitter, receiver, signaling equipment and systems, and miscellaneous equipment, are taken up preparatory to an explanation of the magneto system. Then come chapters of non-multiple common battery systems, the multiple common battery switchboard, the universal switchboard, the multi-office manual switchboard, the feature or service common battery manual switchboard, telephone protective devices, and intercommunicating systems.

Two long chapters are given over to descriptions, respectively, of the Strowger and the panel type automatic systems.

The remaining five chapters deal with the theory of telephone lines, central office power and testing equipment, vacuum tubes, telephone repeaters and multiplex telephony and radio telephony.

The text matter is clearly written, so as to be easily understood, and the diagrams as previously mentioned are simplified as much as possible. The book will give any one a very good idea of the principles and operation of the apparatus and equipment of modern telephone systems.

Prices in the Metal Markets.

New York, June 21—Copper—Dull; electrolytic, spot and futures, 14c asked. Tin—Steady; spot and nearby, $61.37; futures, $60.25. Iron—Steady; No. 1 Northern, $21.50@22; No. 2, Northern, $20@21; No. 2 Southern, $22. Lead—Steady; spot, 8.25c. Zinc—Dull; East St. Louis spot and futures, 7.12c. Antimony—Spot, 11.50c.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Ample Notice to Patrons Required for Gross and Net Rates.

The Nebraska State Railway Commission has ruled that while it will approve of all requests of telephone companies to put in gross and net rate schedules, it will insist that ample notice be given to patrons. This means that merely asking for the rates will not be immediately followed by permission to begin charging them at once. These rates provide that the company may add 25 cents a month to the rates theretofore fixed, where the town patron does not pay within the first ten days of each month and the farm patron within the first month of his quarter.

The commission says that companies that have pursued the policy of allowing patrons to pay whenever they got ready are themselves to blame for a situation that results in certain accumulations of rentals, and that, while this is not a good business policy, it has the effect of establishing a custom that cannot be suddenly changed without causing a lot of friction and ill feeling.

The matter came up on the application of the Lincoln Telephone & Telegraph Co. to have this rule apply to the exchanges at Swanton and Western, purchased from the Campbell interests. The commission deferred the application of the rule to town subscribers to August 1 and to farm patrons until October 1 to get them accustomed to the idea.

Sale of Bloomfield, Neb., Plant Awaiting Commission Approval.

Negotiations have been about completed for the sale of the Bloomfield (Neb.) Telephone Co.'s property to F. R. Beyschau, owner of the exchange at Wynot, Cedar county, a small town located nine miles northeast of Hartington, which is about 30 miles from Bloomfield. Mr. Beyschau is asking for a speedy confirmation of the sale by the state commission.

In his application to that body, he says that he owns the $20,000 worth of property connected with the Wynot exchange, a farm and some city property in Sioux City and, while these have encumbrances on them, he can show a net worth of $25,000 outside of his telephone holdings. He says that the property at Bloomfield has been inventoried at $81,000. He asks authority to issue $60,000 worth of 6 per cent bonds, which he proposes to retire $5,000 a year beginning with June 1, 1931, and reduce the entire funded debt to $35,000, which will all be paid off in 1936.

The property has been owned for the past two years by J. H. Gessler, who has made heroic efforts to make it a paying proposition under a schedule of rates which the patrons of the exchange dictated as what they would pay.

The town is somewhat famous in telephone annals because of the strike staged by the nearly 600 patrons it had about five years ago against the increase in telephone

rates found reasonable and necessary by the state railway commission. The exchange was once a part of the property of the Union Telephone Co. of Wausa.

After spending $25,000 in rebuilding the exchange, which was during the peak period of prices following the war, a modest increase in rates was asked. The commission found that the increased rates were necessary in order to make a return on the actual investment. The people knew better, and under the leadership of an old-time socialist who edits one of the papers there, they started a strike. This lasted for months, the town doing without telephone service save for a few tele-

In disgust, Manager J. E. Baggstrom sold to two Bloomfield men, one of them, Mr. Gessler, who agreed to charge no more than the old rate schedule, and they have vainly tried to make the property pay a reasonable return. Mr. Gessler came nearer to it the last year than before. The greater part of the purchase price is represented by securities held by the Wausa company.

Bloomfield is a rather cocky town. About two years ago it refused to renew a contract with the power company that supplied it with current for home and street lighting, and put in a municipal plant, although the light men say that in the end this will cost the people more in the years to come than the power company contract.

A few weeks ago the railway commission authorized the railroad company that serves the town, which has about 1,600 population and is located on a branch line, to cut the service to two passenger trains a day, the buses and private automobiles having taken away most of the traffic. Following this the town newspaper started in to organize a boycott on the railroad company, calling on everybody to ride the buses, and pointing out how successful a fight was made on the railway commission order in the telephone case.

Higher Rates for Divernon (Ill.) Telephone Co.

The Divernon Telephone Co., of Divernon, Ill., was authorized recently by the Illinois Commerce Commission to place in effect the following annual schedule of increased rates:

Individual line, business	$36
Two-party business	33
Individual residence	27
Four-party residence	21
Rural party business	30
Rural party residence	21
Desk telephones extra	3

City of New York Disputes With Company Over New Rates.

At the end of a hearing on June 16 before the New York Public Service Commission on the increased rates recently allowed the New York Telephone Co., it developed that there was a difference of about $700,000 between the increases made by the company in its new schedules, and what the city of New York thought they should be. The commission allowed the company a total net increase in New York City of $9,111,378 and left the company to distribute this increase among its various classes of patrons.

The company included in the total the 4 per cent payment to the American Telephone & Telegraph Co., amounting to $441,097, $1,474,939 for taxes, and $76,618 for uncollectable revenue, bringing the total increase to be borne by the company's patrons to $11,104,032.

Assistant Corporation Counsel Fertig and the city's expert, Dr. Milo R. Maltbe, objected to the payment to the American company, and the amount charged for taxes. They contended that the inclusion of these two amounts exceeded the increase allowed by the commission by $700,000. The total amount charged for taxes, they contended, should not be a burden to the subscribers in New York City but should be distributed over other sections of the state, according to methods of the company used in adjusting such charges.

H. A. Trax, chief accountant of the company, and H. R. Babay, the company's general commercial engineer who formulated the new rates, explained, when questioned by Frankland Briggs, of counsel for the company, that as the increases were confined to New York City, and the company's application for an increase elsewhere in the state had been refused, the taxes resulting from the higher rates should be confined to the territory affected by them and should not touch the intrastate toll service.

Concerning the $441,097 to pay the 4 per cent due to the parent company as a license contract charge, Mr. Fertig and Dr. Maltbie contended that this was provided for in an item of $4,250,000 allowed by the commission in the list of the company's expenses, and that to allow the charge on the present increase would be giving the company double credit. There was a good deal of discussion, in which the company argued that the item of $4,250,000 was in a list of expenses figured on a gross basis and that the amount sought on the present increase was on a net basis. The idea was that the commission, in figuring to get a rate basis, had mixed up gross and net, thus creating confusing totals.

It was also pointed out that the commission's totals, including the license contract charge, disclosed that the amount required to yield the company 7 per cent was $112,213,878, and that it was earning only $103,102,500, leaving the amount of $9,111,378, which the commission permits the company to earn by increased rates. But Mr. Fertig insisted that the new schedules of the company should be revised so as to decrease the amount yielded by the new rates by $700,000.

Regarding Our Future Responsibility to Telephone Companies

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Nebraska Properties Sold to Several Different Parties.

The Madison Telephone Co. has asked the Nebraska State Railway Commission for authority to issue $30,000 worth of additional 6 per cent preferred stock. The company recently took over the property of the Madison County Farmers Telephone Co., and has now contracted to purchase the tangible assets of the Northwestern Telephone Co. of Neligh.

In addition, it has purchased from the Northern Antelope Telephone Co., also of Neligh, its Brunswick exchange and all of the farm lines its owns out of there and also out of Neligh. This will give the Madison company control of the field at Neligh. It is just finishing a $10,000 exchange building at Madison.

Secretary Pearse tells the commission that it will require $35,000 to pay for the new properties acquired, but that it is proposed to finance the remainder of the purchase with notes.

This sale divests the Northern Antelope company of all of its properties. It sold its exchange at Ewing to Ed Ferguson, together with a line to Frenchtown and one to Savidge. On July 1, A. L. Dawson, of Elgin, will take over the exchanges at Orchard and Royal, small towns, together with rural lines. Between 450 and 500 stations were covered in these transfers. The remainder of the company's 850 telephones are included in the deal with the Madison company for the Brunswick exchange and the rural lines out of there and out of Neligh.

The Neligh exchange which was operated by the Northwestern Telephone Co., was also taken over by the Madison company. The question of free service between these towns is one that the local newspapers regard as important. These locally-owned companies have been giving this service indiscriminately in the past, and it is feared, that as they have not been successful enterprises, the new owners will object to a continuance of the situation along the same liberal lines.

Wisconsin Bell Is Granted Rate Increases at Five Exchanges.

The Wisconsin Railroad Commission, on June 15, granted permission to the Wisconsin Telephone Co. to increase its rates for telephone service at Kaukauna, Berlin, Horicon, Juneau and Watertown.

At Horicon and Juneau the rates filed by the company were allowed without change. At Kaukauna, rates 50 cents per month lower than those filed for one and two-party business service and one-party residence service were allowed, while the new rate for two-party residence service allowed is 25 cents lower than that asked for. The residence rates proposed for Berlin were reduced 25 cents, as were also the Watertown business rates.

The new schedules of monthly rates, which represent increases ranging from 25 cents to $1.75 over the old rates, are:

	Kaukauna	Berlin	Horicon	Juneau	Watertown
Within the urban base rate area:					
Business—					
One-party	$4.00	$3.75	$3.50	$3.50	$3.75
Two-party	3.50	3.25	3.00	3.00	3.25
*Extension					1.00
Residence—					
One-party	2.50	2.25	2.25	2.25	2.25
Two-party	2.25	2.00	2.00	2.00	2.00
Four-party	2.00	1.75	1.75	1.75	1.75
*Extension					.75
*Additional charge for each ⅛ mile of line or fraction thereof on stations located outside of the building in which main station is installed					.40
Outside the urban base area:					
Rural multi-party line station, within six miles from central office (wall set)—					
Business	3.00	3.00	3.00	3.00	3.00
Residence	2.00	2.00	2.00	2.00	2.00
Additional charge for each mile of line or fraction thereof beyond six-mile radius from Central Office	.25	.25	.25	.25	.25
Two-party line, per main station, per quarter mile of line or fraction thereof					.375
Four-party line, per main station, per quarter mile of line or fraction thereof					.1875
Roadway service, per station:					
Business stations	1.00	1.00	1.00	1.00	1.00
Residence stations	.625	.625	.625	.625	.625
A minimum charge equivalent to the rate of five stations is made for any multi-party circuit.					
One-party circuits:					
Business	4.00	3.75	3.50	3.50	3.75
Residence	2.50	2.25	2.25	2.25	2.25

An additional charge is made when transmitter and receiver are furnished.

In determining the reasonableness of the increased rates asked for by the Wisconsin Telephone Co. the commission accepted the following rate bases for the respective exchanges involved in the application: Kaukauna, $85,635; Berlin, $46,226; Horicon, $24,473; Juneau, $33,692; and Watertown, $151,921.

The amount of depreciation allowed by the commission for the different exchanges was determined on a 5 per cent sinking fund basis.

Rates Collected Under Bond for Two Years Are Approved.

The Ohio Public Utilities Commission, on May 26, approved the schedule of increased rates which the Geneva Telephone Co., of Geneva, has been collecting under bond for nearly two years. They are as follows: Business, individual line, $3.75 per month, two-party line, $3.25; residence, individual line, $2.75, four-party line, $2.00.

Early in 1924 the Geneva Telephone Co. filed a schedule of increased rates to become effective May 1. On December 7, 1922, the commission had authorized a schedule of increased rates against which no complaint had been made by the company and for this reason the commission deemed it advisable to enter upon an investigation of the proposed increase. The new schedule was, therefore, suspended for the period prescribed by statute, and at the expiration of the suspension period the increased schedule was placed in effect under bond, and the matter was allowed to continue until the effect of the proposed increase could be determined by actual experience.

The commission found that by an order entered on December 6, 1921, the net present value of applicant's property, as of August 18, 1921, was $136,657.63, but that the company had on hand a stock of materials and supplies to be used in making additions and extensions, which brought the total value up to $141,690; that actual net additions to August 1, 1925 would make a new rate base of $149,778.13.

The commission further found that for the calendar year 1925, the applicant, under the new rates, had collected a gross revenue of $50,121.14; that the actual operating expenses for the same period amounted to $29,067.21; other deductions, including local taxes to the sum of $4,931.30, left a net income of $16,122.63; that allowing 5 per cent of the original rate base of $136,657.63 for depreciation charges, or $6,832.88, and deducting federal income taxes in the amount of $1,161.22, the balance available for return on the original rate base was $8,128.53, or approximately 5.95 per cent, which was not an excessive return on the value of applicant's property.

Summary of Commission Rulings and Schedule of Hearings.

FLORIDA.

June 12: Order issued approving plans of the Southern Bell Telephone & Telegraph Co. to acquire the properties of the Sikes Telephone Co., operating at Bunnell, Flagler Beach, Haw Creek, Lake Diseton, St. Johns Park, Espanola and Favorita, and charge the same rates as those of the Sikes company.

IDAHO.

May 10: The commission granted permission to the Deary Telephone Co., of Deary, to increase its charge for switching service to the lines connected with its system from 35 to 50 cents per month. The commission ordered that the members of the Texas Ridge Cooperative Telephone Co. and the Taney Telephone Co. (which protested to the proposed increase) should be permitted to cut their respective lines and each install a switch therein, whereby it would be possible for their members respectively to communicate with all users of their respective lines; that the users of those portions of the lines entering the Deary exchange should pay 50 cents per month per member switching charge to the Deary exchange, and that the members of those portions of the lines entering the Potlatch exchange should pay a like charge to the Potlatch exchange.

May 14: The commission approved the following schedule of increased rates for the Troy Telephone Co., of Troy: Business, individual line, $3 per month, three-party line, $2.50; residence, individual line, $2.25, six-party line, $1.50; switching service to farmers, 50 cents; switching service if paid for by the line as a unit, 45 cents; extension, business or residence, $1.

ILLINOIS.

May 26: Order approving intercorporate agreement, dated March 27, 1926, between the Illinois Bell Telephone Co. and the Illinois Southern Telephone Co.

May 26: Order vacating suspension of rate schedule Ill. C. C. 2 of the Hamel Mutual Telephone Co., and authorizing company to place in effect, as of June 1, 1926, proposed schedule for telephone service in Hamel, Madison county.

May 26: Order cancelling and annulling suspension of rate schedule Ill. C. C. 2 of the Lexington Home Telephone Co., and authorizing company to place in effect, as of June 1, 1926, proposed schedule of rates for telephone service in the city of Lexington, McLean county and vicinity.

May 26: Order cancelling and annulling rate schedule Ill. C. C. 1 of the Divernon Telephone Co., and authorizing company to file a schedule of rates to be designated rate schedule Ill. C. C. 2 for telephone service in the village of Divernon and vicinity, Sangamon county, effective June 1, 1926.

May 26: Order authorizing the Geneseo Cooperative Telephone Co. to issue and sell $22,290 aggregate par amount of its common capital stock, so as to net company not less than par.

May 26: Order cancelling and striking from the files of the commission rate schedule Ill. C. C. 1 of the State Center Telephone Co., proposing rates for telephone service in Maroa, Macon county, and to file rate schedule Ill. C. C. 2 in lieu thereof.

June 8: Order issued authorizing the Divernon Telephone Co., of Divernon, to increase its rates.

June 22: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Canton, county of Fulton, stated in rate schedule Ill. C. C. No. 4 of the Canton Home Telephone Co.

June 22: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Camp Point, county of

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Adams, stated in rate schedule Ill. C. C. No. 2 of the Camp Point Telephone Co.

June 22: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Ramsey, county of Fayette, stated in rate schedule Ill. C. C. 1 sheet 2, filed by the People's Mutual Telephone Co.

June 22: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Kempton, county of Ford, stated in rate schedule Ill. C. C. No. 2 of the Kempton Telephone Co.

June 23: Hearing at Springfield in the case of the Illinois Southern Telephone Co. vs. W. S. Terry, doing business as Goreville Telephone Co., in the matter of petition for an order requiring the respondent to enter into an intercorporate contract with petitioner covering connections between their lines from Goreville to Marion and Vienna, Williamson county, Ill.

June 23: Hearing at Springfield in the case of the Farmers' Fountain Telephone Co. vs. the Southwestern Bell Telephone Co. and the Harrison Telephone Co., in the matter of complaint of refusal of respondent to establish a physical connection between its toll lines and lines of complainant company at Columbia, Ill.

June 23: Hearing at Springfield in the matter of proposed advance in rates for telephone toll service stated in Ill. C. C. No. 2, supplement No. 2, sheet No. 2 of the Macomb Telephone Co. for Macomb, Ill., and schedule Ill. C. C. No. 1, sheet 3 of Colchester Telephone Co. for Colchester, in McDonough county, Ill.

June 23: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Maroa, Macon county, as stated in rate schedule Ill. C. C. No. 2 of the State Center Telephone Co.

June 23: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Annapolis and vicinity, county of Crawford, stated in rate schedule Ill. C. C. No. 2 of the Porterville Telephone Co. Objections filed by Attorneys Bradbury, Gaines & Bradbury for the Martinsville & Annapolis Telephone Co. and the Maple Creek Telephone Co. against proposed rates.

June 23: Hearing at Springfield in the matter of proposed rules for telephone service in Cropsey, McLean county, stated in rate schedule Ill. C. C. No. 1, sheet 3 of the Cropsey Telephone Co.

June 23: Hearing at Springfield in the matter of application of the Farmers' Fountain Telephone Co. for an order authorizing the petitioner to issue its notes to the amount of $7,000, maturing on or before three years.

June 24: Hearing at Springfield in the matter of application of the Ashley Telephone & Telegraph Co. for a certificate of convenience and necessity to construct line into rural territory adjacent to and surrounding the city of Ashley, in Washington county, Ill.; also in the matter of proposed rates for telephone service in Ashley and vicinity, Washington county, stated in rate schedule Ill. C. C. No. 1, original sheet No. 3 of the Ashley Telephone & Telegraph Co.

June 24: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Roseville, county of Warren, stated in rate schedule Ill. C. C. No. 3 of the Roseville Telephone Co.

INDIANA.

June 11: The commission denied the Southern Indiana Telephone & Telegraph Co. permission to increase its rates at Brownstown and Vallonia, holding that the company is at the present time earning a sufficient return.

MINNESOTA.

June 29: Hearing at New Auburn in the matter of the petition of E. J. Rivers, L. F. Walters, Alvin Misenal, Edw. Hirsch et al., residents of the village of New Auburn, Sibley county, for the establishment of direct local telephone service between the village of New Auburn and the village of Gaylord in that county.

MISSOURI.

May 27: The commission approved the joint application of the Liberty Telephone Co. and the Kansas City Telephone Co. for permission to transfer the exchanges located at Excelsior Springs, Richmond and Norborne to the Southwestern Bell Telephone Co. The Southwestern Bell is given permission to maintain and operate the exchanges so transferred.

NEBRASKA.

June 16: It appearing to the commission that objections have been filed by patrons of the Marion exchange of the Beaver Valley Telephone Co. to the application to close that exchange and supply service to present subscribers from the exchange at Danbury, ordered that a hearing be held at McCook at such a time as may be mutually convenient to the parties involved.

June 16: In the matter of the application of the Lincoln Telephone & Telegraph Co. for permission to charge gross and net rates at the exchanges at Swanton and Western, recently purchased by it, ordered that in view of the advisability of giving ample notice of a change of custom in the matter of advance payments to patrons who have been given unlimited credit in the past, the authority asked for be granted, with the proviso that it apply to town patrons on August 1 next and to farm patrons on October 1.

June 16: In the matter of the application of the Lincoln Telephone & Telegraph Co. for permission to offer metallic farm line service to patrons on its Deweese exchange, ordered that permission be granted, with the proviso that the service shall be optional by lines and that a majority of the patrons on the line shall govern in the matter of service furnished thereon.

June 17: In the matter of the application of the Northwestern Bell Telephone Co. for authority to cancel rates on its recently disposed of exchange at Whitney, ordered that action thereon be withheld

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H. L. GARY,
First Vice-President and Treasurer.

June 16, 1926.

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Telephony.

THE AMERICAN TELEPHONE JOURNAL

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608 S. DEARBORN ST., CHICAGO, ILL.

JUNE 26, 1926. [VOL. 90, NO. 26.]
Entered as second-class matter Sept. 4, 1903, at the post office at Chicago, Ill., under act of March 3, 1879.

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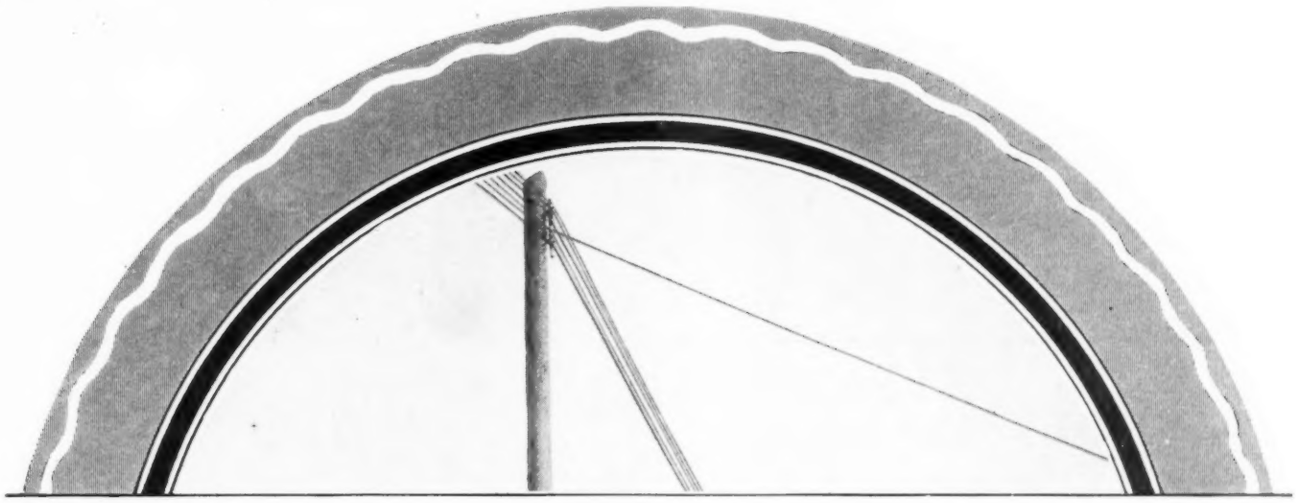

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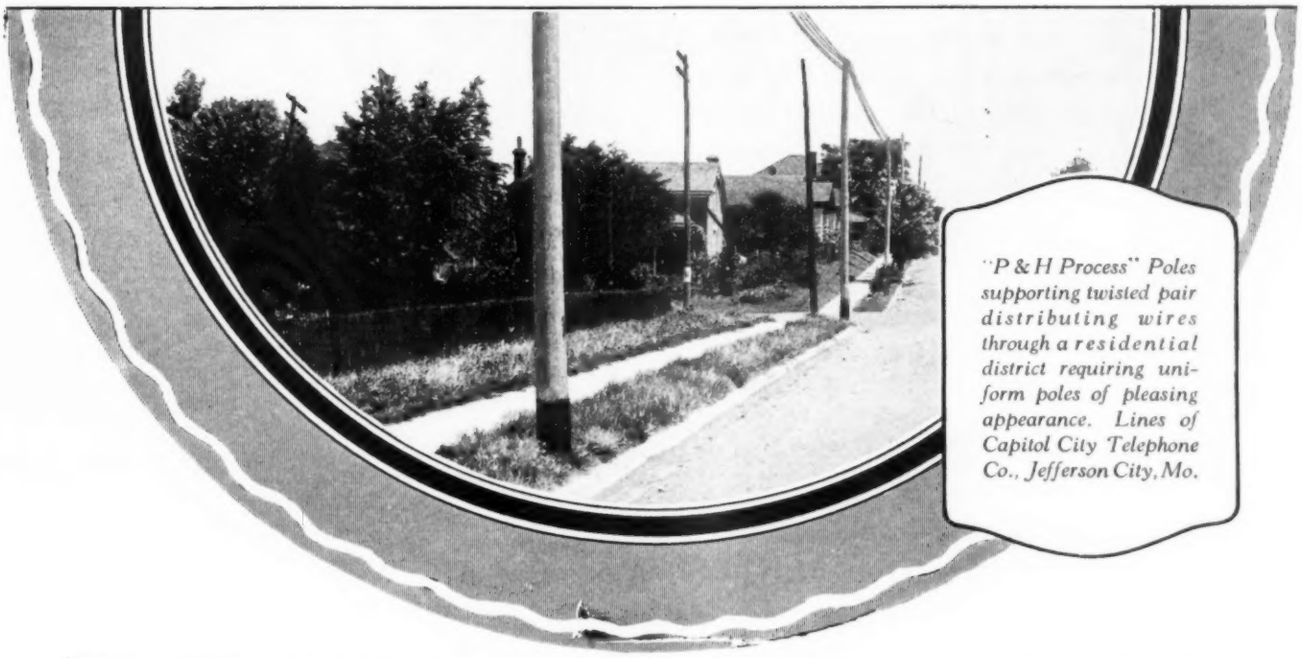

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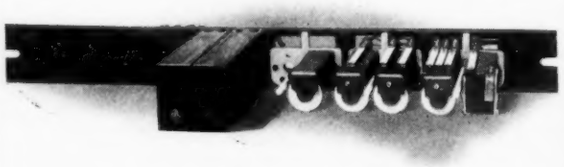

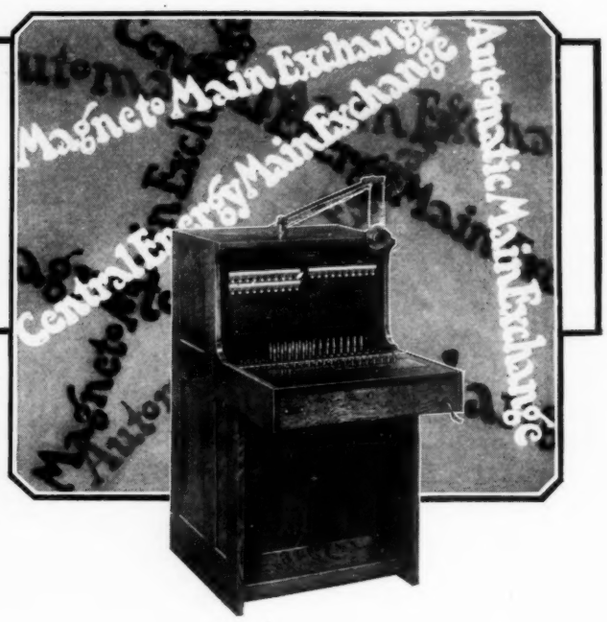

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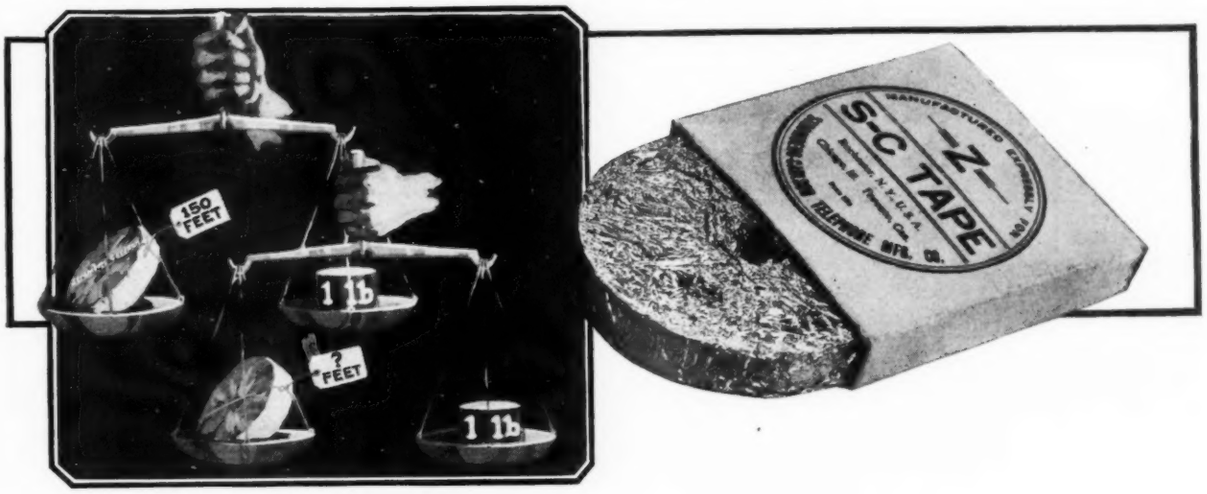

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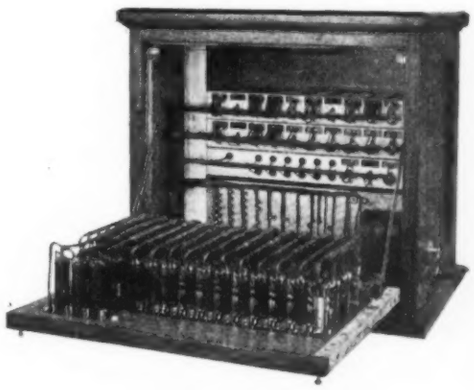

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until such time as the commission can be assured that no question of elimination of competition or of material change in service is involved.

June 17: In the matter of the application of the Northwestern Bell Telephone Co. for authority to change at its Loomis exchange the rule relating to the collection of service station charges from a year in advance to quarterly, authority granted.

June 17: In the matter of the application of the Farmers' Home Telephone Co. of Shelton and Gibbon for authority to make the standard charge of 25 cents additional for desk sets, it appearing that the applicant has a number of these now in service and that any change in the rate would be reflected in revenues, and being further advised that the company is contemplating asking a revision of rates, the application is passed over for consideration in connection with a general revision.

NORTH CAROLINA.

June 12: The Piedmont Telephone & Telegraph Co. filed an application for permission to adjust telephone rates in the town of Belmont.

June 30: Hearing on application of the Piedmont Telephone & Telegraph Co. to adjust telephone rates in the town of Belmont.

OHIO.

June 4: The Galion Telephone Co. authorized to issue its 7 per cent preferred stock of the par value of $90,200 and exchange it for its outstanding 6 per cent preferred capital stock of the same par value in consideration of the renouncement by the holders of the 6 per cent stock of their claim for accumulated unpaid dividends.

OKLAHOMA.

June 21: Hearing in the case of B. Richardson vs. Sam Smith, owner, Red Fork Telephone Co., alleging violation of commission's order No. 879.

TENNESSEE.

June 7: The commission authorized the People's Telephone & Telegraph Co., of Knoxville, Tenn., to increase its capital stock from $150,000 to $300,000 and to transfer $150,000 from its surplus fund to its fixed capital account and distribute the increase in stock among its stockholders as a stock dividend.

The company is also authorized to issue $400,000 of its 6.5 per cent first mortgage gold bonds and sell them at not less than 87 per cent of their face value plus accrued interest, the proceeds from the sale thereof to be used for purposes set forth in the petition.

WISCONSIN.

June 15: Order issued authorizing the Wisconsin Telephone Co. to increase its rates at Kaukauna, Berlin, Horicon, Juneau and Watertown.

June 22: Hearing at Fennimore on the application of the Fennimore Telephone Co. to divide lines 14 and 24 between Boscobel and Fennimore. U-3409.

June 28: Hearing at Madison on the application of the Wisconsin Telephone Co. for authority to increase its rates in the city of Whitewater. U-3334.

June 29: Hearing at Sturgeon Bay on the application of the Wisconsin Telephone Co. for authority to increase its rates in that city. U-3339.

July 6: Hearing at Madison on the application of the Rock County Farmers' Telephone Co. of Janesville for authority to increase its rates beyond the six-mile limit from the city of Janesville. U-3418.

July 8: Hearing at Madison on the application of the Ozaukee-Washington Telephone Co. for authority to dissolve its corporation. U-3412.

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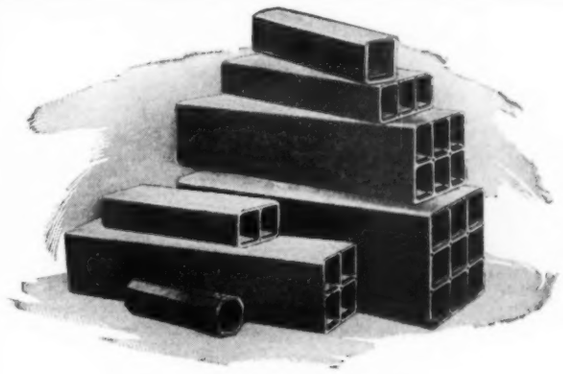

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M6.
Sleeves, Paper
C8, R2, R3, S7.
Soldering Irons
F2.
Soldering Flux, Paste, Salts
C5.
Solder, Lead and Tin
F2.
Solder, Self-Fluxing
C5.
Solders, Sticks, Liquids, etc.
C5, G1.
Splicing Clamps, Pliers, etc.
G1.
Staples, Insulated
B9.
Steps, Pole
A7, G1, H7, L2.
Strand and Cores
C11, G1, H1, R3, R5.
Switchboard Cable
G1, K1, R5, S7, S9.
Switchboards, Telephone
A9, G1, K1, L3, M5, S9, W3.
Tape (Splicing)
G1.
Telephones
A9, K1, L3, M5, N9, S9, W3.
Telephone Supplies (Jobbers)
G1, K1, M5, N5, N9, W2.
Testing Sets
K1, M5, M6, S8, W1.
Tie Wires
C11.
Timing Devices
C1, V3.
Tips and Terminals
G1, R2.
Tools
C9, G1, K2.
Tool Bags and Boxes
G1, K2.
Torches, Blow
G1, U2.
Transmitters
A9, G1, K1, L3, M5, S9, W3.
Tree Trimmers
B3, G1.
Trouble Finders
G1, S8, W1.
Trucks, Motor
F7, G6, I4.
Underground Specialties
C9, G1, N10.
Voltmeters
E2, K1, W1.
Winches
B14, C9, G1.
Wire, Aeroplane
A4, R3.
Wire, Copper, Bare
A4, A5, G1.
Wire, Copper
A4, A5, A7, A8, C11, I1, K1, M5, R1, S7, S9.
Wire, Copper Clad Steel
C11, G1, S7.
Wire, Enameled and Magneto
A5, A7, G1, H1.
Wire, Ironite
P2.
Wire, Galvanized Iron
A5, A7, G1, I1, K1, R2, P2.
Wire Reels, Pay-out and Take Up
G1,
Wire Rope Slings
A7, G1, R3.
Wire, Rubber Covered
A7, G1, H1, R5, S7.
Wire, Telephone and Radio
G1, P2.
Wire, Telephone and Telegraph
A5, A7, C11, G1, I1, P2, R3, S7.
Wire, Twisted Pair
A5, C11, G1, P2.
Wire, Weatherproof
A4, A5, A7, C11, G1, I1, P2, R3, S7.

The letter with accompanying number indicates the name of advertiser as given in full in the Alphabetical Index to Advertisers on the opposite page. *When making known your wants* to any company listed herein, please mention *Telephony*

Note how the contact fuse clip at the bottom of the fuse makes perfect contact while the top of the fuse is an inch from the cable fuse clip.

The carbons ground on a copper ground strip soldered direct to the ground wire.

Protection of Cook Terminals

To our knowledge there has never been the loss of a single cable pair due to inadequate protection or poor insulation of Cook terminals.

Protection to be acceptable should be of known value. Cook protection has demonstrated its value.

The lightning arresters in Cook terminals are carbon blocks specially treated to prevent dusting. Celluloid dielectrics .007 inch thick separate the carbons.

These celluloid dielectrics are absolutely accurate, so that a uniform break down voltage is always assured.

No saw-tooth device yet manufactured is as accurate as carbon blocks separated by celluloid dielectrics.

On a heavy discharge the celluloid melts down and the carbons freeze, forming a permanent ground.

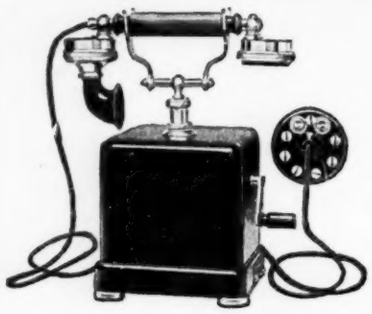
No fuse clips ever designed hold a fuse with more positive tension than do Cook phosphor bronze patented fuse clips.

For more than a quarter of a century, thousands and thousands of cable pairs have depended upon Cook protection for their safety. And to our knowledge there never has been a failure in a properly grounded terminal.

That is just another reason why successful Companies use Cook terminals.

COOK ELECTRIC CO.

2700 Southport Avenue **Chicago, Illinois**



No. 83 Table Set

A SINGLE unit, portable telephone, compactly built. Uses a cradle switch and hand set. The generator, ringer and induction coil are compactly mounted in a neat metal case.

Bells are enclosed in the base, making tampering impossible. Open plates permit ready egress of sound. A rosette terminal block is provided. On this is mounted a reliable lightning arrester.

Rubber protected feet prevent the marring of furniture.

MANUFACTURER

American Electric Company

State and 64th Streets CHICAGO, U. S. A.

"COPPERWELD"

DOES NOT RUST

Line Wire, Messenger and Guy, Twisted Pair, Ground Rods, Etc.

Copperweld Steel Company

MAIN OFFICE & MILLS - BRADDOCK P.O., PENNA.
30 CHURCH ST., NEW YORK 129 S. JEFFERSON ST., CHICAGO
403 RIALTO BLDG., SAN FRANCISCO

COPPERWELD IS MADE BY THE MOLTEN WELDING PROCESS

Northern CEDAR POLES Western

Butt Treating Guaranteed Grades

Bell Lumber Company, Minneapolis, Minn.

MATTHEWS SCRULIX ANCHORS

Better Design
Better Service

W. N. MATTHEWS CORPORATION ST. LOUIS U.S.A. ESTABLISHED 1899

Better Results
Since 1899

W. N. MATTHEWS CORPORATION

3720 Forest Park Blvd.
ST. LOUIS, MO.

Judgment

This is a time for good judgment in the selection of a tree trimmer. Tree trimming is a necessary task — necessary but dangerous. That's why

BARTLETT Tree Trimmers

are insulated in every way and accurately constructed to make the cutting easy and efficient. They are the popular choice of many Bell telephone companies throughout the country.

Are you BARTLETT equipped?

BARTLETT MFG. CO.

451 E. Lafayette Ave.
DETROIT - MICH.

Northern Western

CEDAR POLES

A full assortment of sizes
Prompt Shipments Assured.

T. M. Partridge Lumber Co.

Lumber Exchange MINNEAPOLIS

A complete stock of
KELLOGG TELEPHONES
TELEPHONE SUPPLIES
R C A RADIO EQUIPMENT AND PARTS
NORTHWESTERN ELECTRIC EQUIPMENT COMPANY
SAINT PAUL AND DULUTH, MINNESOTA

NAUGLE POLES

Northern and Western Cedar
Butt-treated or Plain

NAUGLE POLE & TIE CO.

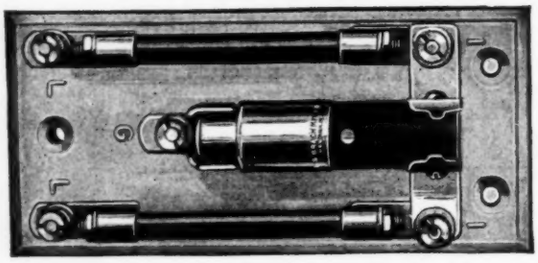
59 East Madison St., Chicago

FOR DEPENDABLE

PLATINUM

CONTACTS, WIRE, SHEET, ETC.

BAKER & CO., INC.
Newark, N. J.
We Buy Scrap



Where Service Counts

You will find that

BRACH VACUUM or NEON GAS ARRESTERS

are given preference because of unfailing duty

Free of the following troubles: Grounding—Dust—Dirt—Moisture—Leaks
Greater Selectivity—Capacity Maintain Voice Currents at Maximum Purity

Catalog No. 24-A will give you some interesting information about arresters

L. S. BRACH MFG. CO. - 127-129 Sussex Ave., Newark, N. J.